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*"I cannot help plead to my countrymen, at every opportunity, to cherish all that is manly and noble in the military profession, because Peace is enervating and no man is wise enough to foretell when soldiers may be in demand again."—SHERMAN.*

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A DECENNIUM OF MILITARY PROGRESS.

BY FIRST LIEUT. J. P. WISSER, 1ST U. S. ARTILLERY.

PERHAPS at no time in the world's history, during an interval of comparative peace, have so many and such great changes and improvements in the science of war taken place, in a period of the same length, as in the ten years just past. It often appears to us, at our great distance, that in all military matters France and Germany lead, while all the rest blindly follow, but a more careful investigation will show that all the changes are the result of keen, intelligent rivalry and healthy and natural growth and development, indeed, in some matters the greater nations have been compelled to follow the smaller.

The changes during these ten years in the strength and composition of the two greatest armies of to-day furnish a graphic picture of the growing importance of military interests, and indicate the particular direction which improvements are taking. In 1884 the German active army, on the peace footing, numbered 427,274, while the total strength of the army (including the *Landsturm*), on the war footing, was 2,655,000 trained soldiers, costing annually \$84,650,000; the French standing army was 426,000 strong, its war strength 1,487,000 trained soldiers, and its annual cost \$116,524,328. In 1894 the active army of Germany had been raised to 480,000 and its war strength to 3,200,000,

while the annual cost had increased to \$107,008,200; the standing army of France had reached a strength of 572,000, and its war army of 4,372,000, the cost increasing to \$126,922,026. The German standing army has therefore been increased in this short time by more than double the strength of our entire army, and the French army even more. The greatest change has been in the fortification artillery, that of France having been nearly doubled (from fifty-seven batteries to a hundred).

The armies of the other nations of Europe have been increased in almost like proportion.

The schools required for the education of the young men who are to officer these armies, as well as for the instruction of the components of the armies as they exist, have developed in proportion to the increase and development of the armies themselves. Even in the United States two of its four military schools of application for officers belong to this period. Although the Infantry and Cavalry School at Fort Leavenworth, Kansas, was established in 1881, its real development belongs to the last decade; its purpose is to instruct lieutenants of infantry and cavalry in their professional duties theoretically and practically, each regiment sending one lieutenant every two years. In 1887 the other great school of application, the Cavalry and Light Artillery School at Fort Riley, Kansas, was organized; there officers and men of three squadrons (each of four *troops*) from different regiments of cavalry, one relieved each year, and five light batteries of artillery, are instructed in their practical military duties.

In Europe particular attention has been given to schools for non-commissioned officers, the natural result of the increased importance of the non-commissioned officer in the field and on the firing line. In 1885 Italy organized two of her ordinary public schools as military schools, that is, exactly like a cadet school, with a view to disseminating military knowledge and especially ideas of discipline; the experiment proved so successful that in the following year three more public schools were arranged in the same way. In Belgium a course in forestry, for the training of soldiers to be used as forest guards, was opened at Bouillon in 1886, and in 1890 a practical agronomic course was introduced in several large garrisons for the instruction of the soldiers in agriculture, with a view to making the service attractive by teaching what will be very useful after the completion of a tour of military duty.



But, aside from the numerous new schools introduced, great improvements have been made in the old ones and all have been much enlarged in this short period. The Saumur Cavalry School for example, has been more than doubled, the Italian military academy at Turin has been increased from 80 to 324 scholars, and the Russian general staff school has been increased by a hundred and ten officers.

The great factor influencing the tactics of cavalry and light artillery, as well as those of infantry, is the infantry fire-arm. In 1884 the armies of the civilized world were still armed with the large calibre rifles, and the question of small calibre arms was just beginning to be seriously considered; indeed, as late as 1884 England adopted the Enfield-Martini gun of large calibre, and began re-arming her army with it, and even as late as 1886 Germany introduced a new magazine repeating rifle of large calibre. The guns in use in 1884 varied in calibre in the different armies from four-tenths to nearly six tenths of an inch. In 1886 France and Portugal initiated the new movement by adopting each a magazine gun of about three-tenths of an inch in calibre, the Lebel and Kropatshek respectively; the other nations followed in rapid succession.

To-day the calibres vary from the Italian (a little over a quarter of an inch) to the French (a trifle over three-tenths of an inch), our own being just three-tenths of an inch. The bullet has been made much longer in proportion to its diameter, although its weight has still been greatly reduced, the modern one weighing less than half what the heaviest of the old form weighed; it is still made of hard lead, but it is now coated with a mantle of German silver or cupro-nickelled steel; the initial velocity has been increased more than one third, and the extreme effective range, which in the best form was formerly not over three thousand yards, is now over forty-one hundred yards; the penetration in elm of the Martini-Henry rifle at one hundred yards was about  $7\frac{1}{4}$  inches, that of the Snider only  $4\frac{1}{4}$  inches, while in sand at 433 yards the average gun penetrated but seven inches, whereas the new arm, even at 215 yards, penetrated  $23\frac{1}{2}$  inches of pine and (at 433 yards) over  $19\frac{1}{2}$  inches of sand. The Lebel projectile will pass through five men in a row at a hundred yards, through four at over four hundred yards, and still through one at over sixteen hundred yards, or nearly a mile; finally, of the heavy ammunition in use ten years ago the soldier could carry but about seventy rounds, while

to day he carries from a hundred and fifty to a hundred and ninety-two rounds, and with the supply in the company ammunition wagons each French soldier has 292 rounds immediately available.

In 1887 France adopted the first smokeless powder, followed in 1889 by Germany and later by the other European nations; these powders, as is now well known, give generally high initial velocities, comparatively low pressures on the gun, and little smoke in the discharge.

The accuracy of fire of the new small calibre rifle is at six hundred yards what that of the old one was at three hundred, its effective range is much greater, its penetration considerably increased, and the lightness of the ammunition allows a greater number of rounds to be carried, and hence avoids, in a degree, the danger of running out of ammunition. The general effects of smokeless powder are: better aiming as well as better firing, and better observation of the effects of fire, with consequent improvement in the mode of conducting and regulating the fire of large bodies of troops.

In 1884 the tactics developed by the Franco-German War were still in force, indeed, in England this new mode of infantry attack had not been introduced even, until that year, and in the United States not until 1891. In general outline this mode of attack consisted of a line of deployed skirmishers, constituting the firing line, a line of supports and a line of reserves; troops in closed masses were not used in the first line of battle, but in the second and third their duty consisted in approaching the firing line, supplying its losses, filling open spaces and gradually strengthening it till it finally formed a dense firing line at the critical moment; the third line could manœuvre freely, but even the second line had some little manœuvring power. The advance took place by successive bounds of small subdivisions, covered by the fire of portions of the line in echelon lying down; the attack proceeded by the uninterrupted advance of the reserves gradually closing up from the rear; the final assault followed as soon as the enemy showed signs of yielding.

The introduction of repeating rifles necessarily brought about changes in the tactical *forms* to conform to the new conditions, and the use of smokeless powder added still another factor to the great problem. The effects of these changes on tactics are, *first*, that the firing must be opened at much greater distances, and the

open order formation will hereafter not only *introduce* and *carry* on the battle, but will be kept up to the end and finally *decide* it; *secondly*, that the second line can no longer *manœuvre* at all; *thirdly*, that columns can no longer be moved about within the zone of the enemy's fire; *fourthly*, that the enemy's fire must first be controlled and subdued, or annihilation will follow a direct attack; and, lastly, that the spade will be more than ever a necessary weapon in the infantry attack as well as the defense, while profiles of trench parapets must be much greater in future (in loose sand at least thirty inches, whereas ten years ago fifteen sufficed).

To-day, therefore, the deployment in open country takes place at about twenty-two hundred yards, volley firing is opened at from thirteen hundred to sixteen hundred yards (ten years ago at less than eight hundred yards), the decisive infantry fire, which took place at three hundred and fifty yards, now occurs at over eight hundred, and the front covered by a battalion in line of battle has been increased more than one-half. *Volley firing* is used at the opening of an engagement, or at any time when the troops are not being fired on; *slow fire* is the general rule up to the decisive firing position, where *rapid fire* (without magazines) is opened to prepare the way for the final assault; *magazine firing* is used just before the final assault, or to drive off cavalry, or in case of any sudden actual contact with the enemy, such as will occur in the combats about field trenches, villages, woods, etc., or, finally, in the pursuit of a defeated enemy; exceptionally also, at greater ranges, whenever favorable targets present themselves and will probably be visible but a short time. Up to about seven hundred yards from the enemy the troops make all possible use of the configuration of the ground, but beyond that point considerations of cover no longer enter the problem. Cyclists are to be used as messengers on the line of battle as well as on outpost duty.

In the latest French drill regulations (1894) the *supports*, or small sub divisions of a company immediately behind the firing line, intended to reinforce this line and gradually strengthen it before the reserves are needed, have been abolished, because they add nothing to the volume of fire and yet are exposed to its effects, moreover, it is considered to be a great advantage to keep entire companies intact, that is, either deployed in the firing line, or in closed order in the reserve line.

The drill regulations of the European nations have been greatly simplified, not only in order to render their acquirement easy, but also to obtain more time for that most essential element in modern instruction, *the individual training* of the soldier, as well as for that decisive factor in war, strict *fire and battle discipline*.

Since the attack in broad daylight has become so dangerous and difficult, especially in open country, *night attacks* will become more frequent, and consequently the armies of Europe practice reconnoissances, deployment for battle, attacks, marches and even target practice (under the electric light, for instance) by night.

Considerable attention has been given of late years to the development of the endurance of the men in making forced marches. Russia and the nations bordering on the Alps have been most assiduous in these exercises. Thus, in 1889, one of the Italian Bersaglieri regiments left Cremona at 8 A. M., marched seven miles (to Aquasegra) in one hour without halting, executed a short battle exercise, rested half an hour, and returned in one and a quarter hours, without having had a straggler either way; again, one of the Alpine regiments marched over the difficult and even dangerous *Colle del Giganti*, nearly eleven thousand feet high, fully armed and equipped, with tenting, the war supply of ammunition, rations, etc. (although without knapsacks). In 1891 company battle manœuvres took place in Russia in the deep snow and cold weather of mid-winter, breast-works being made of the snow; it was found that in loose snow the modern infantry projectile penetrates at eighty yards range a little over two and a half yards, so that a parapet three yards thick will afford full protection, and, of course, if the snow is packed a less thickness will do.

The principles of the employment of cavalry have not changed, but in the training of cavalry many important innovations may be noticed. In 1886 began the exercises in long distance riding and making forced marches, and in swimming large bodies of cavalry over streams, and these have been practiced with increasing interest year after year; about this time, too, arose the question of mounted infantry, but no nation has decided to convert its cavalry into mounted infantry, nor has any nation even organized a permanent force of mounted infantry, indeed, the continental nations use it only in the colonies, and only England is still at work on the subject at home.

Since 1887 cavalry has been trained in all kinds of movements and manœuvres by night, in telegraphy and finally in engineer duty (so that it can, without the assistance of other troops, build, repair or destroy railroads, bridges, roads and telegraph lines). In Russia winter marches are practiced on a large scale; thus, on the eighteenth of December, 1887, for example, nine squadrons made a five days' reconnoissance during a snow-storm, the horses often up to their girths in the snow, making about thirty-three miles a day, without leaving a man or a horse behind.

Of late years great attention has been given to training, with the most painstaking care, not only the individual cavalryman in riding, but also the cavalry horse in all his gaits and movements; more stress is laid on target practice for cavalry; strategical raids, similar to those of our own Civil War, are receiving much attention, especially in Russia; and, finally, great efforts are made everywhere, particularly in Germany, to have all exercises and manœuvres conform to war conditions.

The cuirass has almost entirely disappeared. Although it would still serve as a protection against sabre, lance or bayonet, it is absolutely useless against modern infantry fire and wounds are rendered more dangerous by its use. Consequently Germany laid it aside six years ago, but France still retains it, partly for sentimental reasons, but also as a protection against the lance.

The lance, on the other hand, has been gaining in popularity; the entire German cavalry is now armed with it, and other nations are considering its more extensive introduction; Russia has all the Cossacks, and some of the Guard regiments armed with the lance, England has five home and seven India lancer regiments, Italy has ten regiments so armed, and in 1890 the French armed the front rank of the dragoon regiments with the lance.

All cavalries are gradually adopting the straight sabre, and generally one of lighter weight than the old curved one, and the small-calibre repeating carbine, first taken up by the French in 1888, is being generally introduced.

Penetrating attacks, in which the cavalry is to break through the enemy's infantry and artillery line, have been definitely adopted in Russia, and are practiced in the manœuvres; it is also expected there that cavalry will, under certain circumstances, carry forward a portion of the infantry on the croups of their horses, and that by means of its horses cavalry will be able to

carry off captured guns; both these points have been the subjects of extensive exercises.

In conclusion, it may be remarked that it is now universally believed that the rôle of cavalry has not changed, and, although its work has become more difficult, future wars will still see cavalry attacking infantry.

Before proceeding to discuss the tactics of artillery it will be necessary to take a general survey of the state of artillery material, including the subjects of military ballooning and carrier pigeons.

Balloons were first used for military purposes in France at the commencement of the Revolutionary War when the aeronautic school was established at Meudon; their first application was in two reconnaissances made in 1794 just before the battle of Fleurus, and to the information gained the victory is said to have been due; they are also reported as having been used with advantage in the sieges of Maintz and Ehrenbreitstein (1799); they were also used before Venice in 1849, in the siege of Sebastopol, in the campaign in Italy in 1859, in the Civil War in the United States by the Federals, McClellan's army having had a balloon staff regularly attached, and in the war of the triple alliance against Paraguay in 1866-67. In the siege of Paris balloons were used to take out the mails, sixty-four in all having been sent (only two of which were lost and never heard from), the return mails being brought in by carrier pigeons carried out in the balloons.

The development of the modern military balloon establishments of the European nations, however, belongs practically to the last ten years, England and France having been the pioneers in this science. England had, a few years before the beginning of the last decade, established a balloon corps and school at Chatham, while France, at the institute at Meudon (reestablished in 1875), began experiments in 1830 with a view to perfecting the captive balloon and devising a dirigible one, but the latter was not constructed until 1884, and that year must be regarded as marking a new epoch in the history of military ballooning. Within a year Germany, Russia, Italy and Spain began to organize special corps for this service, employing, however, only the captive balloon, France soon after established balloon parks at all regimental schools of her engineer troops, and balloon establishments were formed in Belgium, Holland, Denmark and China. In Germany the balloon sections have taken part in the fortifi-



cation manœuvres for eight years past, as well as in the grand field manœuvres; the English section has taken part in the exercises at Aldershot for the last three years; and in France the army sections took part in the great manœuvres of 1890 and 1891, the commanding generals on both occasions ascending in person and directing the movements of the troops from the balloons.

In the French campaign in Tonkin in 1884 a balloon section did excellent service in reconnaissance, supplying a great need, as the view on the surface was almost entirely obstructed by the thick bamboo growth. Italy used her balloon section in Massouah, Africa, in 1887, with good results; and in the fortification manœuvres in that year at Verona the defender received daily, by means of balloons, full information of all the movements of the attacking force.

The captive balloon is that generally used: in good weather, at its usual elevation of about 650 yards, the separate arms of the service may be distinguished (with the aid of a good field-glass) at nine miles, when the sun is low at four miles, and immediately after rain in clear weather at fifteen miles; lately, however, the captive balloon has been made to ascend nearly two thousand yards, whereby the field of view is much widened and the range of distinct vision far greater; with a dirigible balloon even greater heights will probably be reached with increased effect.

By carrying along the necessary hydrogen, compressed in steel cylinders, the balloon can be filled in half an hour and has become part of the field train of armies, its proper place being with the main body of the advance guard. In France two sizes are used, of 260 and 540 cubic metres capacity, respectively; the messages are either simply lowered from the basket by strings tied to them, or sent down by means of rings sliding over the anchoring cables. The captive balloon is also used as a signal, while the free balloon (not dirigible) is used in sketching and photography for reconnaissance purposes, and in taking messages and carrier pigeons out from besieged places, the latter to return with messages.

According to experiments carried on in Russia, the balloon can be reached by modern field artillery at elevations up to nearly sixteen hundred yards, but beyond sixteen hundred and twenty-five yards it is safe.

The only dirigible balloon which has been successfully used (having been sent out several times and returned to the same



point), is that of the French, which was in the excellent display at the Paris Exposition in 1889; it is cigar-shaped and propelled by a screw in the forward part, worked by an electric battery. But even this has not always worked satisfactorily. Quite recently Maxim, the well-known electrician and inventor, has investigated this subject and conducted experiments on a large scale in England; his flying machine is an aeroplane moved by a steam motor, weighing only 5.6 lbs. to the horse power, with naphtha as the fuel, working on screw propellers, and obtaining a speed of thirty-seven miles an hour. He remarks on the subject: "If one half the money, the time, and the talent which has been employed by the French balloon corps in their fruitless attempts to construct a navigable balloon should now be employed in the right direction, the whole question of aerial navigation would soon be so perfected that flying-machines would be as common as torpedo boats, and the whole system of modern warfare would be completely changed" (*Century Magazine*, January, 1895).

Carrier pigeons were in use by all ancient peoples,—Egyptians, Persians, Jews, Greeks and Romans,—and were brought to France, Germany and Italy by the crusaders. The interest in them (which had waned in the middle ages) was just reviving when the introduction of the telegraph seemed to render them useless, but the siege of Paris showed that a besieged city may be reduced to this as the only means of communication with the outside world; since that time, consequently, nearly all European nations have taken an interest in the subject, and many private associations exist for the training of carrier pigeons, which are encouraged by the government through the awarding of annual prizes. In its military applications, although a few stations had been established as early as 1876, the entire subject is practically the outgrowth of the last ten years. In 1884 France, Austria-Hungary, Russia and Spain had each a few experimental stations, just organized, and within three years Denmark, Italy, Sweden and Portugal established stations, and in 1889 Germany tried one in connection with the autumn manœuvres.

The *carrier* or *homing pigeon* is a pigeon of a certain special breed trained to convey from one place to another written messages (weighing not over eight grains), tied to the leg, wing or neck; the place to which the message is to be conveyed must be near the pigeon's home, to which it will return from any place whither it may be carried, even as far as a thousand miles. The

Belgian breed is the one commonly used in Europe, but in Spain attempts are being made to obtain a useful cross between the Belgian and a native breed introduced by the Arabs, and in Russia efforts are being made to use the native breed there, since the Belgian cannot endure the climate.

The pigeons are trained by taking them first short distances from their homes and letting them fly back, then longer and longer distances, up to forty miles or more; they are generally sent in but one direction from a given point, but in 1889 Captain Malogoli of the Italian army trained a number to fly to and fro between two stations, up to forty miles apart, which he accomplished by training them to fly in one direction between two stations (they learned this in a month), then, after pairing and remaining for some time in the second station, teaching them the opposite route; finally, the males were made to fast, were then taken to the second station and fed, and allowed to fly back to the first station, but were not fed there, so that they soon flew back again to the second station, where they were again fed, after which they returned to the females at the first station, and so on.

The rate of travel of carrier pigeons is about thirty-four miles an hour, but fifty-nine miles have been made; they can cross high mountains, wide stretches of ocean and snow-covered regions; they have been sent from Rome to Brussels (seven hundred and forty-four miles) over the Alps, and to Elberfeld (eight hundred miles), from Naples over sea to Cagliari (two hundred and eighty miles), and over considerable distances in cold weather with snow on the ground. In the fleet manoeuvres in Italy in 1886 the messages sent by carrier pigeons often arrived several days before those of the dispatch boats.

France has now about two hundred and fifty thousand pigeons, mostly in private establishments, which by law are available for military service in time of war. Italy has twenty-three stations, and Austria-Hungary, Russia, Germany and Spain have stations at all the principal military posts. These stations are under the control either of the general staff or of the engineers, each station being directed by an officer or non-commissioned officer, assisted by a keeper or trainer; from every station four lines radiate, each line requiring for its service two hundred and fifty pigeons; in actual service it is intended to send the same message by at least three different pigeons. In Italy the annual cost per station is

about two hundred dollars; in Germany the total annual cost is fifteen thousand five hundred dollars.

In Russia falcons have lately been trained to capture and destroy carrier pigeons, and they are thus capable of being used in war to intercept the enemy's messages. Swallows have also quite recently been used as carriers: their rate of travel is about eighty miles an hour.

The changes in artillery material in the last ten years have been remarkable, and so abundant that but a brief outline can be given here. In 1884 the United States still had its old muzzle-loading guns, and Italy had not yet given up all her old wooden carriages for field-guns, while England was just fitting out her artillery with new 12-pounders and 22-pounders; rapid-fire guns were only beginning to be adopted, the *Hotchkiss* having been established as a system but a year or two previous, and the Maxim (which can be served by one man, who need fire only the first shot, the recoil doing the rest, viz.: loading, firing, and throwing out the empty cases), firing six hundred shots a minute, having just been invented; the contest between compound plates (wrought iron faced with steel) and all-steel plates for armor had but recently opened; and brown or cocoa powder was being introduced.

The first important change since then was the adoption of rifled field mortars and howitzers (with a view to reaching troops behind parapets by the highly curved fire) as part of the light artillery of the armies. In heavy artillery the tendency toward sea coast guns of very heavy calibre brought forth a 15.7-inch Krupp gun and a 17-inch, 137-ton Armstrong gun. Finally, the invention and introduction of smokeless powders marked the greatest change in modern times.

Among the later changes and tendencies may be mentioned the adoption of a *single piece*, in Germany and Austria, for all the field artillery, together with a *single projectile*, the shrapnel. France still retains a few canister for each piece, although the new shrapnel (*obus à mitraille*) gives more than three times as many separate fragments as that of 1884 gave. However, all the European nations have, for special use against troops close behind a parapet or similar cover, a *torpedo-shell* charged with some high explosive (which causes the fragments to fly out more from the point of bursting).

The new artillery system of the United States is the product

of the last six years. All the light batteries are now armed with modern guns of the latest and best construction, while the newly established Army Gun Factory of West Troy, New York, is manufacturing the guns for our heavy artillery. The carriages for mortars and for 12-inch guns in gun-lift batteries, as well as those of the non-disappearing type, were adopted a year or more ago, and the Buffington-Crozier patterns of disappearing carriages for the 8-inch and 10-inch guns have just been selected. All the guns of the system are rifled steel breech-loaders.

The tactics of field artillery, on account of the improvements in guns, powder, projectiles, caissons and other material, have undergone considerable modifications. Up to 1884 the Drill regulations of 1875 in France, and of 1877 in Germany (both the direct results of the war) were still in use. At this time a field battery could fire (with proper loading and aiming) but three or four shots a minute. The first position of the field artillery in battle was between sixteen hundred and twenty-six hundred yards from the enemy (*i. e.*, beyond the then infantry fire), its duty there being to silence the enemy's artillery and thus prepare the way for the deployment and advance of the infantry; its second (or decisive) position was at about nineteen hundred yards (nearer if the topography was favorable), its duty there being to shatter the enemy's infantry line and thus prepare the way for the infantry attack; a third position (when practicable) was taken up at ten hundred yards.

The appearance in 1888 of a new drill regulations for the Prussian field artillery, followed in 1889 by the general introduction of smokeless powder, marks the turning point in the development of modern artillery tactics. All Europe awoke at once to a new interest in the subject, and almost immediately field mortars and howitzers for the attack (by curved fire) of infantry in intrenched positions were introduced, while in Germany a new organization of the field artillery resulted within a year. With the old black powder it was possible to have, for most effective action, too many batteries in one place (in other words, attached to one army corps), but the smokeless powder changed all this, and consequently Germany immediately added a number of new batteries, giving each corps over twenty and generally twenty-two batteries, whereas formerly there were less than twenty in nearly every corps.

To-day, on account of the increased range and accuracy of

small arms as well as shrapnel, artillery *must* open the artillery combat at about twenty-seven hundred yards (in open country), and *may* be compelled to open it at fifty-four hundred yards; in general, it will be able to take up a second, the decisive, position at about two thousand yards (though many think this is doubtful), but no third position will probably be possible. On the march it is kept near the head of the main body, so as to come early and quickly into action when the enemy is encountered. A battery can now fire (by using the gun-brake for limiting the recoil) ten or twelve shots a minute, but no army has yet decided to change the old rate, on account of the time still required for the *observation* of each shot; indeed, they are all rather inclined to reduce the number of guns in a battery to four, because this number is as efficient to-day as the six were formerly, quite as difficult to command, and can better accommodate itself to the configuration of the ground.

Smokeless powder had, of course, considerable effect in modifying firing regulations: it made the determination of the range a more difficult matter, as the smoke of a firing battery (formerly of great assistance) is no longer visible at battle ranges, but, on the other hand, it also made the observation of the effects on the enemy's batteries, as well as of any movements on his part, easier, because the field of view is now clear of smoke.

The question of rapid fire guns is fairly well settled to the effect that the earlier forms, of smaller calibre, belong to the infantry, while the later forms of calibres approaching those of field guns belong to the artillery,—the supposed advantages of the latter (of calibres beyond those used for *mountain* artillery), however, are still under discussion.

Great as have been the changes in material and tactics, in no branch of military science has such a complete revolution taken place as in that of permanent fortifications: The old bastioned fort of the French and the polygonal fort of the Germans have both disappeared as systems of fortification. The three great factors influencing modern fortification are the *increased power* of modern artillery, the improvements in high angle or *plunging fire* (destroying the former protective effect of traverses and other shelters) and the *greater range* of guns (exposing the whole of the already greatly extended works of the defense to their fire); to which must now be added the *high explosives* to be used in projectiles.

The great feature of the new system is the use of armor, either

in the form of turrets, or in the form of armored guns or batteries. As massive protective material *beton*, or concrete, made of good Portland cement, and applied in two layers with a layer of sand between, has been adopted, while earth is used only as a *masking* material.

The principal systems in use are those of Brialmont, the great Belgian engineer, and Schumann, whose methods Germany endorses. Brialmont's is a system of large forts with great intervals, and comprises usually an interior city with a continuous line of defense about it, surrounded at about four miles by a girdle of triangular or trapezoidal forts, separated one from the other some two and a half miles, with permanent batteries for about six howitzers or mortars between, arranged as redoubts; turrets for heavy guns are placed in the shoulders of the forts, at the middle of the faces, behind the faces and in the flanks, while around salient angles are disappearing turrets for rapid-fire guns. Schumann's, on the other hand, is a system of small forts at short intervals, consisting of groups of Gruson revolving turrets, armored batteries and gun-lifts, besides guns in movable armored shields which can be transported from point to point, as required; the distance between groups is not over twelve hundred yards.

Belgium completed the fortification of Antwerp (Brialmont's first great work) in the last decade, and from 1888 to 1891 the same engineer fortified the line of the Meuse with forts comprising in all one hundred and ninety-two turrets. Roumania fortified the Sereth line according to Schumann's method, but in 1883 Brialmont planned the fortifications of the capital, Bucharest, which were begun in 1885 and completed in 1892, containing a hundred and twenty-two turrets. Switzerland has fortified St. Maurice and the St. Gothard with turrets and armored batteries, and lately Turkey has called Brialmont to devise a new system of defense for the country. France and Italy are still continuing the fortification of Paris and Spezzia, respectively, according to the old method, although the former has erected a few turrets on the Belfort line, while both have closed a number of Alpine passes with modern forts.

In 1885 a board of army and navy officers and civilians was appointed to consider the fortifications required on our seaboard, and on its report the system now being constructed is based. Mortar batteries are now under construction at both entrances to New York harbor, at Boston and at San Francisco;



a gun-lift battery for two 12-inch guns has been constructed at Sandy Hook; disappearing gun batteries are under construction (some completed) at Portland, Boston, New York Harbor, Hampton Roads and San Francisco; mining casemates, with their cable galleries, are built at all the most important harbors; and as soon as money is available the fortification of the harbors of Charleston, Savannah and New Orleans will be begun.

The largest high-power guns will be mounted in iron turrets, the 12-inch guns in iron casemates or on gun-lifts, the 10-inch and 8-inch guns on disappearing carriages (or, if the site be high, on ordinary carriages); all batteries, including the mortar batteries, will be protected by earth and concrete, forty feet of concrete and ten of sand covering the magazines, while parapets are of twenty-five feet of concrete with an exterior covering of earth. Rapid-fire guns, concealed in pits until required for use, are to be employed for sweeping mined field and water approaches. Submarine mines will be used to obstruct the passage of vessels past the batteries. (General H. L. Abbot in JOURNAL OF THE MILITARY SERVICE INSTITUTION, May, 1894.)

The increased importance of field fortifications (due to the accuracy and great range of modern fire-arms) and the necessity which an army is under to intrench itself nowadays where it halts, where it fights, has rendered the study of this subject a matter of necessity not only for the technical troops (engineers, pioneers, sappers, etc.), but also for the ordinary troops of the three great arms, the cavalry, infantry and artillery.

The most important changes have been in the dimensions of the profiles of intrenchments and other earth-works, but these are very great: parapets of *rifle pits* in their latest form in Germany vary in thickness at the crown from three and a quarter to six and a half feet (depending on the distance from the enemy), in France from one and three-quarters to seven feet; parapets of *trenches* in Germany are made ten feet thick, in France nine feet. They are so placed as to be screened from the enemy's view as much as possible, and the profiles are modified by the same considerations.

The methods of attacking permanent fortifications have undergone as complete a revolution as the systems of fortification themselves. Up to 1884 the introduction of long-range guns had merely changed the *distances* between positions; there were still a preliminary, a first and a second artillery position,—the so.



called three *parallels* surrounding the point of attack,—connected by zigzag approaches wide enough for the transportation of artillery through them and with thick parapets. The introduction of mortars and howitzers with curved fire, as well as smokeless powder and armored turrets and batteries changed all this.

The artillery will hereafter require but *one* position for its siege guns, generally at from twenty-two hundred to thirty-two hundred yards, although the field guns or the lighter siege guns can still take up other positions in advance. While the decisive artillery position is being organized, the outposts will strengthen their position with field-works, usually at sixteen hundred to twenty-two hundred yards from the fort ; but as soon as the firing is opened the lighter guns will be drawn in to the heavy artillery position. The trenches will be made wide enough only for infantry in double rank (since the artillery will no longer have to be moved through them), and with light parapets (since the modern mortars and howitzers can fire *over* them, and therefore the defender will not waste time trying to fire *through* them). The advance of infantry or light batteries to new positions in front can only take place by night. Mines will hardly be used in the attack in future, the last assault being based on surprise, and executed over the surface on a broad front,—not as formerly on a single breach.

Balloons and carrier pigeons must be included as factors in the tactics of fortification war ; forts must be abundantly supplied with electric search-lights in future ; and bicycles and tricycles will be used by messengers between the city and its forts. Position finders, by which the path of a ship is automatically described on paper, are now in use, and will be a necessary part of the equipment of all large forts on the sea-board, and the pushing of a button, when the ship crosses the hair-line of a telescope set at the proper angle, fires several aimed guns electrically.

In future, siege trains must take comparatively heavy position artillery with them into the field, as well as mortars of fair calibre. A Russian siege-train to-day comprises four hundred and twenty-four guns, the heavier guns and mortars being carried in two parts, which can be readily screwed together. Portable railway bridges, portable traverses for protection against infantry fire, speaking tubes for the rapid transmission of orders and messages, self-illuminated compasses for use in concentrating troops at night, or on points not indicated on the maps, and moveable observation stations, for overlooking the battle-field (all of which

have been already experimented with in Russia and elsewhere, will probably form part of future siege trains.

It is now an established rule that, in case of mobilization, the troops for the occupation of the principal forts on the border, as well as those required for the siege trains, must be ready to take the field (properly trained and equipped) with the rest of the army, for they will probably be needed at once, and if not ready will delay the field army in a most serious way.

The idea recently in vogue that all permanent fortifications will in future be dispensed with, or the view that they must all be open to the rear, or, finally, the assumption that improvised and moveable fortifications, to be constructed or placed in position as required, will be all sufficient,—all these extreme fancies have crystallized into reasonable notions intermediate in character; on the other hand, the building of extensive fortifications, without the proper supply of fortification artillery to garrison them in time of need, is also a mistake.

We will close this outline of recent progress with a brief sketch of the changes in two subjects which have experienced a wonderful development, viz.: railroads and telegraphy. The importance of railroads in the movements of armies has become greater and greater as the network of roads has become more and more extended. In France and Germany they are by law placed for purposes of national defense under the state, and even in time of peace they are under the railroad section of the great general staff, the entire network being divided into a number of circuits, each under a *line commission* (composed of a field officer of the army and a railroad official).

Several of the European nations have organized special railroad troops: Germany has a *railroad brigade* of two regiments (besides a Bavarian battalion and a Saxon and a Wurtemberg company), France uses the fifth regiment of engineers for that purpose and has besides nine special sections, Italy has a brigade, Austria-Hungary a combined railroad and telegraph regiment (besides eight special sections), and Turkey, Denmark, Belgium and Holland have recently organized such troops. The army at large is, however, also required to practice each year loading and unloading cars with troops, horses, wagons and material, and each battalion, squadron or battery is required to have a certain number of men specially trained in this duty.

The European nations are at present occupied with a portable

field railway of narrow gauge (about two feet), including rails and rolling material, to form part of the heavy train. Such a road can be laid at a daily rate of over six miles, and can carry daily enough to supply from three to five (depending on the road-bed) army corps. France used such a railroad in the expedition against Tunis in 1883, and in Tonkin in 1884; Russia employed one in the expedition against the Teke Turkomans in 1880, Italy in her occupation of Massouah, and Holland in her wars in Sumatra.

Military telegraphy, the interest in which dates from the Franco-German War, received its practical development since 1883, when England, Italy and Austria-Hungary first organized telegraph troops and Russia increased her telegraph parks to seventeen. Within a few years schools for instruction in military telegraphy (electrical and optical) were established in a number of countries, and to-day all the European nations, except France, Germany and Austria-Hungary (where it is merely one of the duties of the engineers) have separate telegraph *corps*.

For the electric telegraph in the field fir poles weighing under seven pounds have been generally used, but lately England, Austria-Hungary and France have adopted poles of bamboo weighing less than two and a half pounds. The surface cable, however, is gradually replacing the over-head lines, the typical forms being the *Austrian*, 0.22 inch in total diameter, insulated by two rubber layers and a hemp fibre covering, the *Siemens No. 17*, 0.13 inch, and the *Buchholz Outpost Cable*, 0.13 inch (used with a return wire). The Morse recorder requires the heavier and better insulated cable, but with a *Carden vibrator*, which transforms the motions of the sounding key into acoustic dots and dashes in the receiving Bell telephone, the lighter cables can be used. In the night after the battle of Tel-el-Kebir, one hundred and fifteen messages (averaging thirty words) were received by means of this instrument. The English field cable, recently adopted, can be laid at the rate of three miles an hour, or as fast as infantry marches.

Optical telegraphy was used successfully in the campaign in Tonkin, a *fixed* line of stations, three hundred and sixty miles long, having been established behind the army, with a *mobile* field section in actual contact with the advancing troops. In Algiers France has a complete network of optical telegraph stations extending out to the extreme borders.

In both France and Germany the principal forts and ocean cable termini are connected by underground wires with each other and finally with the central stations, Paris and Berlin, respectively; and at every large fort each battery and advanced work is similarly connected with the main work.

During the past ten years the use of cyclists on reconnaissance and messenger duty has received attention throughout the military world. The training was largely voluntary at first, but now Spain has a permanent cyclist section in her railroad battalion, and a temporary section for instruction in each infantry regiment, Sweden has in each division ten infantry soldiers trained annually as cyclist messengers, Holland has a corps of seventy-five cyclists, France has two men per regiment detailed on this duty, Denmark has a school in bicycling, which a certain number of recruits annually attend, England trains about twenty each year at Aldershot, and the other nations encourage bicycling (by offering prizes) as a valuable military sport. In 1893 Germany, Russia and Portugal used cyclists in the autumn manœuvres with excellent results, and it is expected that permanent sections will soon be organized in all armies.

Quite recently France, Russia, Austria-Hungary and the Netherlands have been considering the use of dogs as messengers (the despatches being tied to the collar), both in communicating between permanent fortifications, and on outpost duty (between sentinels and pickets and between the latter and the main body), or, indeed, at any time when the telegraph fails; their ordinary rate of travel is about six hundred and fifty yards a minute.

This completes the sketch we have attempted to draw in rough outline and with bold strokes: evidently the world has advanced in this branch of science (to us in the United States of such minor importance, but to the rest of the world second only to statesmanship) quite as rapidly as in any other.

## THE BALLOON IN THE CIVIL WAR.

BY CAPTAIN W. A. GLASSFORD, U. S. SIGNAL CORPS.

THE position which the military balloon, whether automobile or captive, is clearly destined to occupy in all military operations of the present and future, is so commanding as to attach no inconsiderable interest to the early history and development of military aeronautics. Here, as in so many other prominent instances, the army of the United States essayed practical tests of the balloon during the Civil War. What use was made of the new instrument of war will be here set forth.

In its relation to military purposes the beginnings of the war balloon must be sought in the history of the Civil War. It had been projected before by foreign commanders—in the early Revolutionary War of the French; again, an aeronautical equipment was prepared for the Egyptian campaign under Bonaparte; and in the Sardinian war it was used at Solferino. It was suggested for the operations in Mexico under General Scott, but was not adopted. Ballooning, therefore, as an adjunct of military operations to overlook the camp of the enemy, or on the field of battle for reconnaissance and securing information, as also to enable artillery fire to be effectively directed to the right points, and in siege communication, is of recent adoption. But its thorough test as an available instrument of war had not yet been fully determined. It is the progressing change in modern ordnance with the consequent modification of tactics that has operated to bring the balloon so prominently before military men. At the present time all the War Powers of Europe maintain extensive aeronautical parks; and the advance in the construction and operation of the captive and dirigible balloon has been startling.

But as a practical assistance to the soldier in our war, the history of the war balloon begins when in the spring of 1861 President Lincoln summoned to Washington for consultation Thaddeus S. C. Lowe, an aeronaut at that time of some note. At much the same time—that is early in 1861—James Allen, Sr., of Providence, R. I., actuated by a spirit of patriotism and a conviction that the air-ship had distinct military value, made haste to offer to Gov-

error Sprague of his own State the services of himself and the use of two of his balloons at the front. Governor Sprague was quick to see the advantages of this means of military observation, and so sent Mr. Allen out with the troops mustered into service under the first call for three months' men.

From this action of the President and of the war governor of Rhode Island grew the Aeronautical Corps; but it seems to have had during all its operations only a loose organization and not to have been endowed with military or relative rank. So far as can be discovered from the scanty reports of its operations in the field, the professional aeronauts had charge of the inflation, ascension and custody of the balloons, and of the operations necessary to supply the hydrogen gas needed to fill them. To each balloon party was detailed a squad of men under command of a commissioned officer—for the purposes of escort, of holding the balloon captive or of transporting it when inflated, in accordance with directions. The balloon thus provided with a civilian aeronaut and such temporary detachment as was necessary to handle it, was at the service of any officer who might desire to inspect the position or works of the enemy.

It appears that for the most part engineer officers held immediate command of the balloons and made the greatest number of ascensions. It also appears that the professional aeronauts were not of themselves successful observers of the enemy; this was of course due to the absence of military training on their part and to their lack of experience in estimating the numbers of bodies of men on the march or behind entrenched lines. General Fitz John Porter reports, which supports this view, that at the battle of Fair Oaks the aeronaut transmitted the information to him from above that the enemy in large force was moving *up* stream. And General Porter continues: "This was so contrary to what the enemy should do that I called the balloon down and ascended—to see the enemy moving *down* stream; and my report reached General McClellan in time to prepare to meet the intended attack."

This Aeronautical Corps in the time during which it was employed by the army used quite a number of balloons. Aeronaut Allen, whose services were confined to the Army of the Potomac, states that according to his recollection but five were used. He supplies the following list of names of balloons together with their gas capacity and the number of men each was capable of



carrying up:—the "Eagle," 13,000 cubic feet, 2 men, 3 guide ropes of 1000 feet; the "Excelsior" of the same capacity as the "Eagle"; the "Washington," 16,000 cubic feet, 3 men, 3 guide ropes; the "Constitution" of the same size as the "Washington"; the "Intrepid," 35,000 cubic feet, 5 or 6 men, 3 ropes.

Of the "Enterprise," "Pioneer," "North America," "United States," and "Gen. Scott," mentioned in reports, the record of dimensions has not been preserved. A number of balloons appear to have been in use without names.

Silk was the only material employed in the construction of these air-ships. The guide ropes were manilla stuff, one-half to three-fourths of an inch in diameter.

With the exception of Aeronaut Allen's first ascension from Camp Sprague near Washington—when coal gas from the city mains was employed and again when his two balloons were inflated at Alexandria with the same gas, hydrogen was the only gas in use. For the purpose of generating this hydrogen the Washington Navy Yard constructed tanks mounted on wheels—two tanks for each balloon. The capacity of each such tank was sufficient for two or three barrels of iron turnings and five carboys of commercial sulphuric acid, together with the necessary quantity of water to dilute the chemicals to their best condition for gas production. The tanks were fitted up inside with many small shelves for the purpose of distributing the metal in small quantities so as to permit the most rapid action of the acid. These tanks were usually set up in close proximity to a stream which would supply the necessary water for dilution.

The transport of the balloon train was accomplished by means of the regular army wagon—three, four or more, according to the size of the train. Each such train carried the balloon, 20 carboys of sulphuric acid, a ton and one-half of iron turnings, two generating tanks, with the necessary tubs for cooling and washing the gas. The escort consisted of a squad of men under a commissioned officer—who, as already indicated, were employed to guard, anchor and manipulate the balloon.

The height of ascension was practically limited to 1000 feet; but under ordinary circumstances of wind and conditions of elevation of the surrounding country an altitude of 200, 300 or 500 feet was usually sufficient to afford a satisfactory view of the enemy's works and manœuvres. Between the beginning of the war and the last use of the balloon for observation at Chancellors-



ville, the number of ascensions seems to have been limited only by the number of times officers desired to ascend.

When the balloons were used on the march a new inflation was apparently necessary each day; but when they were used in connection with siege operations one inflation, barring accidents, was usually adequate for several days.

This Aeronautical Corps, practically an independent civil organization acting under orders of officers of the army, appears to have established very slight, if any, connection with the United States Military Telegraph, itself a similar civil body, or with the military organization of the Signal Corps.

It seems plain that the only sure means of communication by which the observer in the balloon could transmit the results of his observations to the points where they would do the most good was by shouting to the officer in command of the anchor-party below. By him those shouted reports would be transmitted to the Commanding General by courier, by the field telegraph lines, or by the skilled military signalist, as the circumstances might best indicate. It is evident that not until a much later period was it found uniformly practicable to establish an electrical station in the car of the balloon itself. But there was on one occasion a telegraphic dispatch sent from the car of a balloon addressed to President Lincoln from Aeronaut Allen's balloon "*Enterprise*" hovering over Washington. The dispatch is in somewhat grandiose terms, is announced to be the first sent from mid-air, contains no military information, and is signed by Aeronaut Lowe. But such a valuable adjunct to the balloon service could not fail to recommend itself to the officers most concerned, and particularly to the engineers who chiefly directed the aeronauts in their ascensions. Such electrical communication was attempted at Fair Oaks; this being at the time of the misleading report from the balloon which General Porter had the fortunate presence of mind to correct. The absence of this swift and secure means of communication must be held to be one of the chief causes which led to the disuse of the balloon in the later and more momentous campaigns of the war.

This same absence of touch with the military character of operations was also noteworthy in the fact that the aeronaut was not a skilled military man, and that officers of the army appear to have, as a rule, used this vehicle for random inspection of the enemy only during the intervals of the work to which they had

dedicated courage, skill, and the perfection of professional training. This inability to understand what he was seeing appears to have been recognized even by Aeronaut Lowe himself. In the battle of Chancellorsville he dates a report "Balloon in the Air, May 1, 1863—2.15 P. M." After a hazy and confused report of smoke in large volumes and the probability that large forces on each side were engaged, he concludes with a sentence that is tantamount to a confession of his military inefficiency in particular contrast with the clearness of the reports of the skilled officers of the Signal Corps on the same field. It is this: "This would be a good time for some staff officer to ascend, if it is desirable to you."

In this same connection it is to be noted that even trained military officers were not immediately available for purposes of such aerial observation. This seems to have been due to the natural diffidence which most men experience until practice has made them familiar with the sensations of floating in mid air. These experiences during the Civil War fairly indicate the need which obtains for a specialized corps of military balloonists, who have had such abundant opportunity to study their art that in time of need they may render the best possible service to the forces with which they are operating.

From the references already made to the number of balloons built for the Union forces, and from the record which will follow of the engagements in which the services of the aeronauts were employed, it will be seen that balloons, for a time at least, were used to no inconsiderable extent by the Union army.

While the use of the balloon by the Confederates is known to have been very scanty, an interesting account of the construction, use and ultimate fate of one balloon—believed to be the only one in the Confederate army—is given by General Longstreet. He says: "The Federals had been using balloons in examining our positions, and we watched with anxious eyes their beautiful observations as they floated high up in the air, well out of range of our guns. While we were longing for the balloons that poverty denied us, a genius arose for the occasion and suggested that we send out and gather all the silk dresses in the Confederacy and make a balloon. It was done; and soon we had a great patchwork ship of many and varied hues which was ready for use in the Seven Days' campaign. We had no gas except in Richmond, and it was the custom to inflate the balloon there, tie it securely

to an engine, and run it down the York River Railroad to any point at which we desired to send it up. One day it was on a steamer down the James when the tide went out and left the vessel and balloon high and dry on a bar. The Federals gathered it in and with it the last silk dress in the Confederacy."

The first Federal use of the balloon was in the camps about Washington. It has already been stated that Aeronaut Allen brought two balloons from Providence to Camp Sprague. He reports that he made one ascension from that camp, using ordinary coal gas. Later, but still during his three-months' service, he was instructed to inflate both his balloons with coal gas at Alexandria and float them to Falls Church to operate with Burnside's command. One of these balloons placed in charge of a private was blown to pieces within a mile after leaving Alexandria; the second was similarly destroyed after Aeronaut Allen had made a single ascension at Falls Church; a double loss which fell upon this distinguished and disinterested aeronautical engineer. After the completion of his three-months' service Aeronaut Allen joined Aeronaut Lowe in the Corps which the latter had organized. In the same early period of the war, La Mountain who had distinguished himself as an aeronaut, made ascensions from Washington in a captive balloon. In one of these ascensions he cut the cord and floated over the enemy's lines at an elevation of 4800 feet. He made careful observations and came to earth in Maryland and communicated the results of his voyage to General McClellan.

It will be remembered that President Lincoln, attracted by the fame in the Ohio valley of Aeronaut Lowe called the latter to Washington. The result appears at a somewhat later period of 1861 at Fort Corcoran, one of the defenses of Washington and a post commanded by that gallant soldier and distinguished officer General Fitz John Porter. At that time the dividing line between the forces of the North and of the South was close to the Potomac River. Fort Corcoran, a considerable earth-work now obliterated, was situated across the river from Georgetown Heights and served practically as a "tête du pont" for the Aqueduct Bridge connecting Georgetown with the Virginia shore. To this fortification Aeronaut Lowe and his balloon were sent, and General Porter made daily use of their services by ascending to a height which enabled him to overlook the Virginia eminences. He thus spent hours in the careful study of the country, distinguishing

valleys, ridges, hills, and shadows, and looking out for any movement or presence of the enemy as soldiers or civilians. From his recollection of this extended study of topography from above, General Porter makes a note that in such study of a country, care, time, experience and military instinct, are needful, since when viewed from a balloon the land below looks like a valley without ridges or depressions.

As showing another phase of the utility of the balloon in war, General Porter relates this incident of one of his ascensions from Fort Corcoran. From his balloon he observed evidences of the construction of a field-work upon the ridge of a commanding eminence; and although he watched the unfinished work for more than two hours not a man was to be seen about it. With a shrewd comprehension of the situation he ordered the balloon to be brought down to earth again; and half-an-hour later he allowed it to shoot up suddenly and was gratified with the sight of the enemy scurrying away to cover to hide themselves from his watchful eye. We have a direct testimony to the value of the balloon in this regard in a statement made by Gen. E. P. Alexander. He writes: "I have never understood why the enemy (Federals) abandoned the use of military balloons early in 1863, after having used them extensively up to that time. Even if the observers never saw anything, they would have been worth all they cost for the annoyance and delays they caused us in trying to keep our movements out of their sight."

The first time that the aeronauts were exposed to the incidents of actual war is comprehended in the experience of Aeronaut E. Locke Mason. He was in charge of a balloon ordered down the Potomac to Shipping Point, where the Confederates after First Bull Run had established a six-gun battery. The balloon was transported and elevated from a small river steamer which had been altered for such use. During this trip the balloon and party narrowly escaped falling into the hands of the enemy and would have done so but for their prompt rescue by the Federal forces from the Maryland shore.

After the ascensions at Fort Corcoran which proved to General Porter the possibilities of the value, for reconnoitring purposes, which existed in the balloon, we next find Aeronauts Lowe and Allen at Fort Monroe in March 1862. At this place they were preparing to join the Army of the Potomac in its first campaign, along the York River peninsula, opened early in that

month. When the Union forces had sat down before Yorktown to begin the siege, General Porter renewed his excursions to the upper air, made frequent ascensions, and supplied General McClellan with daily reports of the distribution and movements of the enemy's forces within the beleaguered town. His account of his own balloon operations is clearly indicative of the value which must attach to the military balloon under conditions such as existed when he made his ascensions. That is to say, when the observer in the car is not a mere civilian aeronaut but a military officer of skill, acumen, and the necessary training derived from service, to see what he really does see, to understand what is going on before his eyes, and to indicate to the officer commanding the forces below the exact state of affairs, with that precision which is instinct to the trained military man but which is non-existent in the case of those whose pursuits have been civilian. It is very plain that the military balloon never had during that war, a fairer trial than at the siege of Yorktown, and never responded more satisfactorily to the demands made upon it. During the siege General Porter experienced one of those incidents, which, though rarely to be looked for with skill in aeronautics, must yet be regarded as one of the remote possibilities of military ballooning. It was during the progress of an important aerial reconnoissance which General McClellan had directed him to make for the definite settlement of the part which the naval forces might properly be called upon to play in the prosecution of the siege. As showing the ease with which the soldier trained to act in emergencies could grapple with a problem quite new to him, General Porter's statement will be found interesting reading. He had ascended at dawn intending to stay aloft an hour or more making sketches of the works. He writes: "I was scarcely 50 feet in the air when the single rope holding the balloon broke and I was let loose in the air and for a few minutes until I got control of the valve was much confused. Though the current of wind near the ground was toward the sea, in a few minutes I found myself drifting over Yorktown. I took good observations, some notes, but mainly instantaneous impressions like a photographic instrument, and had the enemy's position and defenses so grafted on my mind that when I descended I was able to give a good sketch of everything. I always noticed which way the wind blew when I ascended in the balloon, and the day I broke loose I saw it was blowing eastward. When I

found myself going northwestward and had taken my rapid observations I let out the gas and gradually fell to the undercurrent, and went back to land in our camp. I always required two ropes to be attached to the balloon and thought they were so when I entered the basket. I was afterwards told that the previous day a new man had been put in charge of the balloon party, the old manager (not Prof. Lowe but the one under him) having been removed. The men were angry, and thinking the new man would make a trip they removed one rope and applied acid to the other. When they saw me enter, they were frightened and feared if they said anything they would get into trouble; so they let me go up, preferring that I should suffer rather than themselves."

Referring to this same balloon in this siege, General Daniel Butterfield regarded its use as very valuable. He writes: "I was sent up to make a reconnoissance with a view to the advance against the fortifications held by the enemy. It had been decided to make regular siege approaches and not to attempt an assault across the open in front of their works. My ascent in the balloon gave me a thorough and perfect understanding of the topography and made clear to me the best and easiest line of approach; and that was adopted. The enemy abandoned the works and the value of the choice of the line of approach never came up. It convinced me that the balloon in that respect was of great service."

It will be remembered that the sight of the balloons floating in the air above Fort Corcoran put a stop to Confederate building of an earth-work. General Porter narrates a similar incident at the siege of Yorktown, which goes to show that much of the value of the balloon lay in its preventing the enemy from making movements into which secrecy entered as a factor. He says: "On another day late in the afternoon I had reason to suspect the enemy was making arrangements to abandon the works. He pretended to convey the impression of intention to attack us. I ascended in the balloon and was rapidly fired upon causing many of the men holding the ropes to run away and thus impress me that the ropes would break again. My impressions were confirmed. A battalion or brigade was moving out of Yorktown toward Richmond, and was some distance away, when the sight of the balloon caused them to be faced about and marched towards Yorktown, evidently to create the impression that they



were strengthening the garrison instead of deserting it. The following night they abandoned Yorktown." An independent observation was obtained by General (then Captain) Custer from Warwick Court House. He ascended at daybreak in Aeronaut Allen's balloon from that point and saw the last of the evacuation.

It will be seen that two balloons, at least, were in use with the Army of the Potomac in its advance upon Richmond, one of which was operated by Aeronaut Allen and the other, apparently the "*Intrepid*," by another member of the Aeronautical Corps and at times possibly by Aeronaut Lowe, for a war-time photograph is in existence which shows him in the car of the "*Intrepid*" somewhere about the height of the tree-tops. When the army was occupying both banks of the Chickahominy this balloon was employed at Gaines Mill with the centre of the army. Aeronaut Allen's balloon with the right wing at Mechanicsville, some eight miles from Richmond, made daily ascensions for some weeks. The Engineer officers used this balloon freely, and Major Webb of that corps went up in it almost daily.

After the battle of Malvern Hill Aeronaut Lowe became incapacitated through sickness and appears no more at the fighting front during the great retreat. The command of the balloons devolved at this juncture upon Aeronaut Allen. While the army lay under the protection of the gunboat fleet at Harrison's Landing daily ascensions were made. Having been provided with a flat-boat the Aeronautical Corps operated, for one day at least, with the navy, under Commodore Wilkes, at a point ten miles down the James River, and obtained some valuable information.

While the greatest number of balloons was to be found in the Army of the Potomac, their use was not entirely restricted to that army. In General Burnside's Roanoke Island Expedition the balloon "*North America*" was in charge of Aeronaut Starkweather. Similarly, a balloon was used in connection with the siege of Island No. 10, and it is reported that the services of the balloon were satisfactorily employed in directing the fire of the siege guns. Beyond this interesting statement the reports are silent as to the value of the aeronauts in these two operations.

The next use of the balloon in connection with the Army of the Potomac appears, at some little interval, at Fredericksburg, where Aeronaut Lowe had sufficiently recovered to resume operations in the air. He had reported a certain number of the enemy



massed behind Marye's Heights. The report was not believed by the Commanding General, and General Butterfield, commanding the 5th Corps d'armée in that engagement started to make an ascent for the purpose of estimating the correctness and value of the aeronaut's judgment; but that is a point which through the fortune of war has had to remain forever unsettled. Before reaching a sufficient altitude to enable him to see the ground in rear of Marye's Heights and to determine a point so vital to the safety of the army, General Butterfield was recalled to earth to move his corps across the river to Fredericksburg in order to deliver the second assault after the withdrawal of the Second Corps from its equally brilliant charge. He says however: "My short ascent in the balloon had given me a view of the topography, ravines, streams, roads, etc., that was of great value in making dispositions and movements of the troops."

In this same engagement the two or three balloons acting with the Army of the Potomac were in the military charge of Lieut. Comstock of the engineers, who made many ascensions, sometimes going to a height of 2000 feet and frequently remaining up for an hour or more. His experience resulted in favorable impression of the value of the balloon for the observation of the topography and the disposition and movement of forces. But it must be remembered that this officer had received a training so thorough and so specialized that, as soon as experience had endowed him with confidence in the balloon, he became such an observer as could scarcely be found outside a corps of true military balloonists.

With the use of two or even three balloons at Fredericksburg it seems strange that none of the reports available show that any of the aeronauts seemed to have observed the position of the famous stone wall from the protection of which was delivered a fire so deadly as scarcely to be matched in the history of warfare.

After the battle of Fredericksburg, the Army of the Potomac went into cantonment at Falmouth, and the Aeronautical Corps shared the winter inaction. When the campaign opened in the spring the balloonists made a brief appearance in the early activities of the campaign of 1863, and then disappeared from the armies of the United States.

For more than 30 years the army of the United States had no balloon until its acquisition of the modern balloon equipment, now in the Department of the Colorado, under the direction of

the Signal Corps; thus wedding to the Aeronautical Corps that military experience the absence of which was its most fatal defect in the hot years of civil strife.

The last appearance of the war balloon of the old army was at the engagement of Chancellorsville; and no good seems to have come of it there. General Butterfield, who should know, writes: "I dont recall uses of any value at Chancellorsville. A study of the official reports might do so." A careful examination of all the official reports of that engagement fails to disclose that the Aeronautical Corps was of the slightest use over that field.

In addition to the names of aeronauts already mentioned in this sketch, it has been possible to identify other balloonists who took part in this service. We find the names, but without record of their performances, of aeronants Paulin, Eben, Seaver, Steiner, and E. S. Allen.

It is proper to improve this opportunity for expressing grateful recognition of valuable information received from several sources and thankfully used in the preparation of this paper. Particular recognition is the due of General Fitz John Porter, General Daniel Butterfield, General C. B. Comstock, and General Paul A. Oliver, who have contributed interesting details of the use of balloons and valuable opinions as to the services rendered by the Aeronautical Corps. From actual members of that corps considerable historical matter has been received in letters from James Allen, Sr., and E. Locke Mason. The publications of T. S. C. Lowe detailing his participation in the War of the Rebellion have been carefully collated for use in connection with the official records.

It will be observed that with the exception of the report of balloons at Roanoke Island and Island No. 10 these scanty records have to do with the balloons only in their connection with the Army of the Potomac. But this need occasion no feeling that the record is on that account incomplete, as the aeronautical corps did not exist in the other armies then in the field. The great and victorious armies of the west depended for their necessary information upon the well-equipped and skillful detachments of the Signal Corps.

## LIMITATIONS OF THE NATIONAL GUARD.\*

BY LIEUTENANT LOUIS C. SCHERER, 5TH U. S. CAVALRY.

AT no time has industrial accumulation, with its results, progress and civilization, been possible unless accompanied by the will and power to defend it. No nation was ever allowed to throw its full energies into the pursuits of peace till it had proved what it was able and willing to endure in war. In studying the progress of military art we dwell in succession on the proudest days of all great nations on earth, and learn that when this art was neglected the fall of the nation was seldom far distant.

The military institutions of a nation are governed by various considerations. No great nation has so simple a military problem as America. Our only need is that we should be in a position to discuss international questions with our neighbors and with foreign powers, without having our great cities and their vast wealth and commercial interests absolutely at the mercy of those powers. We are, by virtue of our enormous wealth, great numbers, and vast territory, and the constantly increasing sentiments of loyalty to the existing constitutional government, entirely free from all danger of a war of conquest.

The student of American history cannot but notice the high value set upon military education and training by the founders of the Republic. But has the progress in military art kept pace with the requirements of our great nation? Since the days when the Fathers instituted the militia system in 1792, we have advanced to the foremost rank among nations, standing first in wealth, first in the production of brain and hand, in invention, manufacture, arts, and agriculture—and last in the security of our national defense.

There are many causes for this negligence. The very simplicity of the problem of defense may have led us as a nation to undervalue its importance. By reason of our fortunate position,

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our free institutions, our vast resources, and constantly growing population, we have lost sight of the urgent necessity of devoting a considerable part of our resources to the expensive art of war.

In the American character antipathy to war ranks first among political traits. The majority of Americans have always regarded war in a peculiar light, the consequence of comparative security. The possibility of waging wars like those of 1812 and 1861 without incurring ruin, explains the existence of the national trait and had great influence in assuring its existence. The old Republican party of Thomas Jefferson was founded on dislike of every function of government necessary to a military system and this dislike is still a political trait of our people.

Success in several wars, however providentially achieved, and at no matter what cost, has inflated us with an overweening sense of security and invincibility. That this confidence in our powers really exists to a ridiculous degree, is seen from the following, published in one of our influential daily papers a few years ago, when reference was made to our inadequate preparation for war: "The fellows who sneer at our little army and our old hulk of a navy forget that there are fifty million people behind them. Uncle Sam can wave that old flag from the top of the National Capitol or from some peak on the Rocky Mountains and sound a bugle call, and ships would fall in line, and one and one-half million of men would answer, 'Ready.'"

The theory of all military organizations is centralization, exactly the opposite of a free civil government, and the very condition of things that our Constitution aims to provide against. It would, on that account, be extremely difficult, if not impossible, to enact military laws, while the States are so jealous of any approach to centralization, which would be implied in a military organization necessary to an adequate system of defense. The present condition, however, of our national forces, is the result more of indifference than of a deliberate or intelligent judgment of our needs.

No examples are necessary to show that nations are proverbially conscienceless and apt to measure right by might, nor are arguments needed to demonstrate that to be to some extent prepared to assert and defend our rights is but a necessary step to putting ourselves on a footing from which to conduct negotiations with some prospect of being accorded a respectful and considerate hearing. If, as some people hope, this country is to exert

upon the world the beneficial influence of a great people, raising their voice only for what is right, and meeting other nations in such a spirit that the inevitable differences of opinion, which may from time to time arise between the most friendly nations, are to be settled without bloodshed, that influence will be strengthened and widened, if we add to our admitted wish for peace the unquestioned fact that we can resist and punish any attack which foreign nations in the excitement of some great controversy might be tempted to make on us.

The entire military force upon which we rely for the defense of this country against foreign and domestic foes, and for the enforcement of law, is divided into two separate and distinct classes. These are the Regular Army, which is authorized to be raised and supported by Congress, and the Militia, which is designated by the Constitution as "The Militia of the several States," and is controlled, regulated, and commanded by the several States, except when called forth to execute the laws of the Union, suppress insurrection and repel invasion. The national antipathy to a large standing army has always kept the regular force at a minimum requisite for purposes of internal police. There are two fundamental political axioms which our people are never tired of repeating; that a standing army is dangerous to the liberties of the Republic, and that a well-regulated militia is necessary to the security of a free state. To the Militia, therefore, we must look for the military security of the nation. It has the advantage of being in existence, it is older than the Constitution and is recognized by it. It is the force which our people have been brought up to regard as the source of our military strength, and consequently it has much popular sympathy and support. This, then, being the force on which we rely for security, for it is the one having the sanction of the people necessary for its maintenance, let us see what are its possibilities, its defects, its drawbacks, its weaknesses; in short, its limitations. The very existence of the Militia, is, in the minds of some military writers, an evil in itself, as through it and the fancied, as they assume, security depending on it, a proper army and a good system of reserves is made an impossibility.

The question of defense must be considered under two aspects, military and economical; that of efficiency and that of cost. Although the hereditary fear of standing armies as a menace to liberty was the principal factor, yet there can be no doubt that

the question of cost had great influence in adopting the militia system for our defense. This question has at least always played an important part in any changes that have been proposed for the improvement of the system. The actual cost of such a force is very small, but its real economy is more than doubtful. While in active service the Militia costs more than the Regular Army. On this subject Secretary Monroe wrote to Congress in 1814: "It may be stated with confidence that at least three times the force of militia has been employed at our principal cities, along the coast, and on the frontier, in marching to and returning thence, that would have been necessary in regular troops, and that the expenses attending it have been proportionately augmented, from the difficulty, if not the impossibility, of preserving the same degree of system in the Militia as in the regular service. The cost of putting them in the field is always disproportionately great. Another source of waste is in the time required for this. The state governments and the national government will struggle to avoid a call of Militia, even though risking great disasters by the neglect. Opposed to trained armies they invite defeat; opposed to similar forces, decisive action on either side is impossible and the war drags on till its cost far exceeds that of years of standing armies and peace preparations. But wars are expensive, not alone in the direct cost of life and property, but, for us, in the continuous tax of enormous pension lists. The character of the troops employed has a good deal to do with the amount of pensions paid after a war, and no one can doubt that the employment of the Militia would tend to greatly increase the amount."

The next question that presents itself is the manner of raising the Militia and the laws under which it exists. These laws are wholly inadequate and obsolete, and the National Guard of the present day may be said to exist in spite of, rather than by reason of, our militia laws. That the present laws are obsolete is seen in the fact that they contain many requirements so absurd that neither the State nor Federal Governments affect to observe them. That new ones are necessary is seen in the many attempts to enact them. In spite of the important authority over the Militia given to Congress by the Constitution, and the evident intention that the Militia should play an important part in the Constitutional Government, Congress has done little or nothing to provide for an efficient militia. The legislatures of all the States have



revised their military codes since 1881. The laws are perhaps as nearly uniform as the laws of the different States on any single subject, but they can never take the place of a national and uniform enactment.

The problem is to draft a national law, adequate to our needs, and not repugnant to the people. The difficulty of the problem lies in the fact that the two conditions it must fulfill are antagonistic. The measure must have popular approval. An aristocratic government may declare universal service and enforce it in such degree and form as it pleases, but a republic can only impose such liability to service as the people may consider necessary, just, and reasonable, and must also choose its form of army organization to suit the same democratic sovereignty. They hold the powers of creation and support, and must be satisfied of the necessity for an organization, and with the suitability of its form, in order that it may be created or continue to exist. The old law of 1792 must serve as a model for any new enactment on the subject. The carefully guarded rights of the States as exemplified in that Act prove that it was drafted by persons familiar with the legal checks and balances of organic law.

The Militia is a militia of the States and not of the general government, and no part of the Constitution is worded with greater care and with more scrupulous jealousy than that which grants and limits the power of Congress over it. The fact that the Militia is not under one but under as many governments as we have States, gives rise to many questions concerning its efficiency. When Congress has adopted such legislation as shall seem to it wise for the organization, arming and disciplining of the Militia, its power over it in times of peace is exhausted. And with it the power of the general government is exhausted, for none of the officers of either the executive or judicial departments of the general government have any control over the Militia of the several States in time of peace.

Many have been the attempts to give the Militia more of the characteristics of a national force, by increasing the powers of Congress over it and in other ways. On May 28, 1789, an act was passed in Congress, which, among other provisions, contained one which called for the organization of a sort of National Militia. The provisions of this act, authorizing the President to appoint the officers of this militia, were pronounced undoubtedly unconstitutional and dangerous to the country. In 1815, in the annual

message to Congress, President Madison recommended, "such an organization of the Militia as would place it more promptly and effectually under control of the national government." In 1826, a mixed board of army and militia officers, instituted by the Secretary of War, to devise a plan for ameliorating our militia system, recommended as an important feature thereof, an adjutant general for the whole Militia of the United States. Even in late years the establishment of a Federal National Guard has seemed to many to be the only means of escaping from the burden of a large standing army on the one hand, and on the other, from the lack of thoroughness and uniformity of training and discipline, and the insubordination to Federal authority when opposed to State sentiment, which have on more than one occasion in our history, proved the cause of national disgrace. Some think that on the position taken by the Militia in this question, their future will depend. If it develops its national side, they say, it will have an opportunity to assume an importance such as no force composed of men with civic pursuits has ever attained.

It may be doubted that the National Government will ever again be placed in a position to force it to listen to the dictates of a State having a large and powerful militia. At an epoch during the War of 1812, it was only a question of time when the National Government must abandon the attempts to support an army; and then its only recourse would lie in the State armies. Massachusetts at that time had 70,000 men well drilled and equipped, and whenever it should say the word, the war must stop. What one State may not be able to achieve again, a combination of the most powerful ones might still bring about.

The question as to what service can be required of the State Militia, when in the service of the United States, is one often discussed, and the conclusions arrived at differ greatly. Although all States admit the right to order the Militia to service outside the limits of their own States, the same question might be brought up again by the troops themselves, and the nation must wait for the battle-field in each case to test the question. But it should know beforehand that its troops are not to be restrained by any conscientious constitutional scruples before it dare bring them into the presence of the enemy.

The authority of the President to issue orders directly to officers of the National Guard, calling them into service, is also too well settled to even remotely admit of discussion, yet a few years

since, when in time of some local excitement, the Commander of the First Division, New York National Guard, expressed an intention to obey such an order if received, a large part of the press denounced him as almost guilty of treason. Such discussions and expressions of doubt cannot but work to the detriment of discipline.

The raising of the Militia is by voluntary enlistment in the several States. The "enrolled Militia," according to the law, includes all able bodied male citizens between the ages of eighteen and forty-five. Under the law of the United States as it exists to-day—with which the State law, however, is in direct conflict—the captain of any militia regiment in New York can enroll all the able-bodied citizens of that city in his company, and call upon them to attend muster and drill, duly provided with arms and equipments, that could be found only in a museum of antiquities. If the military manhood of the nation were called out to day, in accordance with this provision, it would be of such magnitude that as an army or armies it could not be economically used. Nor could such numbers ever be drilled or disciplined sufficiently to pay for their existence. The superabundance of material should induce the Government to contract the age limits. Medical authorities claim that the most effective armies have been those in which the youngest men were twenty-two years old, and in the Militia this should be the minimum age for recruits. But while immature men should not be accepted, neither are too old men good recruits, thirty-five years being the extreme under ordinary conditions. Errors in this direction are not to be feared, the tendency being rather to enlist mere boys, and it is wrong to expect any great and long continued exercise of force from a lad of 18 or 20, such as is required in the work laid out for them in the seven or eight days instruction in the annual camp, as at present instituted by many of the States. But it is not only in respect to age that the recruiting of the Militia is faulty. The matter of recruiting is the foundation upon which the whole military organization rests, and it is impossible to have an efficient army without carefully selected men. That the strongest army is the best army, is a saying as old as the Romans, and properly interpreted, is true. Other things being equal, those with the most endurance are the best soldiers. Uniform recruiting regulations should be adopted for all States and carefully followed.

While the numbers of the so-called "enrolled militia" are ex-

cessive, there is on the other hand, no guaranty that a certain number of men will be kept in readiness by the States, either for their own use or that of the National Government. It is not mandatory upon States to sustain a militia of a certain size, corresponding to their population. Congress has no constitutional right to require the States to organize and equip a certain number of militia. Laws attempting to effect this were passed in 1794 and in 1807, but were inoperative on account of their unconstitutionality. The power over the Militia reserved by the Constitution to the States is so complete, that a State may, unless restrained by its own constitution, enact laws to prevent any body of men whatever, other than the regularly organized Militia of the State and the troops of the United States from associating together as a military company or organization, or to drill with arms in any place whatever, without the consent of the Governor of the State. The only remedy the general government has, in case the different States will not develop their militia, is to develop and enlarge the army.

If the Militia is to be our reliance, the number actually maintained should be adequate to our needs, and each State should be required to sustain, in efficient condition, its quota of this number. Political economists class all military expenditures as non-productive. Perhaps they might more fairly be called indirectly productive, as necessary to the maintenance and extension of civilization, and the protection and development of trade. Further, the value of property increases with increased security, and thus they may be treated broadly as a tax for insurance. Since this security is a national as well as a State question, the tax should not be heavier than necessity requires, nor should it fall more heavily on the more progressive States, but should, like any other tax, be evenly distributed among the various ones who reap the benefit of the protection.

But not only in the proportionate number of men supplied by the several States is there a discrepancy, but also in the various amounts expended to maintain this force. The organized Militia costs \$24.00 annually per man, or about four cents per unit of population, of which amount the Government contributes one-sixth and the States five-sixths. The Southern States expend less on their militia than they receive from the general government, while in the West the Government contribution is only about one-third the total cost; in certain Eastern States

one-sixth; and on the Pacific Slope and in the vicinity of New York, the States pay fourteen times as much as the General Government. At present the Government contribution is divided among the States according to their representation in Congress, regardless of the condition of the force in any State, provided only that this force is reported "organized and uniformed" to the extent of one hundred men to every senator and representative. The Government might well make its assistance dependent on the number of men present in camp, fully armed and equipped, and instructed in drill and rifle practice, as determined by its own inspectors, according to certain definite standards.

The object of all military institutions is to develop the highest amount of fighting power, and this can be expected only of a force with the proper organization. It is impossible that any force, such as our present National Guard, which is composed of troops organized under so many different authorities, can have the cohesion necessary to a successful fighting force. There can be no doubt that the present organization of the Militia is a faulty one. There is no plan or system in accordance with which the forces of the various States would take their proper place as parts of an operating army, or troops from different States be brigaded or assigned to divisions, or army corps; or by which general officers would get commands. Nor has any plan or system been adopted of employing them collectively with the army. Nor is the Militia organized as a complete unit in each State to resist the dangers to which the State is most exposed, or even to aid the army.

The necessity of a uniform organization for the entire Militia was very clearly pointed out by Washington. Concerning the Militia, as concerning other military matters, Washington's opinions were radically different from those of most of his contemporaries in politics. What he had in mind was a force uniformly organized, armed, equipped, and clothed, throughout the several States, and as thoroughly trained and disciplined as the circumstances of their military service being other than the principal object of their lives, would permit. His long military experience had impressed upon him the immense advantage of uniform training and organization. In his letter to the Governors of all the States, written from Newburg on the disbanding of the army in 1783, he says: "The Militia of this country must be considered as the palladium of our security, and the first effectual

resort in case of hostility. It is essential, therefore, that the same system should pervade the whole, that the formation and discipline of the continent should be absolutely uniform; and that the same species of arms, accoutrements, and military apparatus should be introduced into every part of the United States. No one who has not learned it from experience can conceive the difficulty, expense and confusion which result from a contrary system, or the vague arguments which have hitherto prevailed."

Nor is any organization complete that fails to provide for mobilization. In military affairs the element of time is of immense importance. Ability to mobilize a few hours earlier than an adversary may mean not only the initiative in a campaign, but the advantage throughout a war.

Going more into the details of the Militia organization, we find first that the staff departments, though so important, are at the same time the most inefficient portion of the whole system. We find three notable defects. First, inordinate rank, with reference to duty, size of force, and the origin of the possessors, which is partly due to misappreciation of function or duty; second, unnecessary numbers, out of all proportion to ostensible duty and responsibility; third, a vicious system (or lack of any system) in making appointments, previous service or aptitude seemingly having no consideration. The staffs of the National Guard in most of the States are mere figure-heads, more or less ornamental; they are not expected to do duty, and in most cases could not do it if required. This is especially true of what is known as the Governor's staff. How far the absurdity of adding unnecessary numbers is carried, one illustration will suffice to show. A general order dated, Headquarters National Guard, State of Minnesota, March 5, 1895, designates, besides thirteen other staff officers, ten colonels, two lieutenant colonels and four majors as aides-de-camp on the Governor's staff. Minnesota has three regiments of infantry already provided with a sufficient staff in that of the brigadier general commanding. Such a staff is not only valueless, but also detrimental to the best interests of the Militia. Even if the officers on the staff do no duty, they absorb a considerable portion of the military appropriation in mileage, which money could be applied to great advantage in establishing one or more of the staff departments on a solid basis. The greatest evil of such a staff is that it tends to cheapen military



rank, to belittle the lower grades, and to render the whole establishment ridiculous by the multiplicity of officers, who are known to their townsmen to be absolutely without any military qualifications. What must be the reflection of a militia man, who has by hard work become a sergeant, to see his neighbor who has had no drill, suddenly appointed colonel on the Governor's staff, the position having been given him on account of his political influence?

Bands are considered a necessary part of European armies. They promote the training and discipline, so necessary to the efficiency in an army, to a degree far more than commensurate with their cost. Their utility in this direction would be even greater than ordinarily in such an organization as the Militia. The fact that nearly all militia regiments could easily enlist good bandsmen and at very little expense, is an argument favoring their adoption. Whether bands are present or not, field music must be provided and each company ought to be required to enlist musicians for this purpose.

That in this and other particulars the present organization is faulty is seen in the numerous changes made every year. Reorganization has become the cry of the day among military men, and is also beginning to be recognized by the public and its representatives in the legislatures of States and in Congress. There are certain general conditions which pertain to a republican form of government which will have more or less influence in the selection of an organization, and may, under some conditions, even constitute the principal factors for the determination of the particular form to be adopted. There is, however, one best form of organization, and this, when decided on, should be adopted for all the States.

The Militia being under State control, limit themselves in most instances to the development of infantry bodies; the States do not, as a rule, look at the question of military organization from a sufficiently broad standpoint to see either the need or value of entire and complete units, nor would it be possible for any but a few States to carry into effect the complete organization of the higher tactical bodies. Such organizations as the States have at present are not complete, they lack the relative proportions of the other arms, the artillery and cavalry, and also of the special troops. Furthermore, if these special branches did exist there would be no common standard or test of efficiency,

and they might easily degenerate into useless additions to the force. The artillery and cavalry act as auxiliary arms, prepare the way, confirm victory, or arrest pursuit. Thus it comes about that in no tactical action is any arm of the service complete without the others. Good artillery is especially indispensable to an army composed of green troops, and a good artillery requires special training. The ordinary methods of militia training can never produce efficient batteries, but good results may be obtained by offering special inducements to the States maintaining artillery. The proportion of this arm in the Militia is too small, there being only 76 batteries of 4500 men, out of an aggregate of 110,000 men of all arms. The proportion of cavalry is, however, still smaller, there being only 3800 cavalymen in the entire force. In many States there is no cavalry; in New York, in 1890, with a force of 14,000 men there was only one troop of cavalry; and Kentucky, noted for its horses and riders, has a National Guard of 1200 with not a single cavalryman.

It is now universally acknowledged that of all arms, cavalry is the one that is required to be in the most constant state of preparation for war, since it is generally a matter of vital importance for it to be pushed to the front at once, or in our own case, to be present at the theatre of war in strong force at the very beginning of the campaign. It is the recognition of this necessity which reconciles the great military powers to the endurance of the heavy burden of keeping up vast hosts of cavalry at their full strength during long years of peace, in order to be ready for instant action on the outbreak of war. The cavalry and artillery arms should be in their proper proportion to the rest and should receive special attention in training.

It is to be deplored that the States have not given more attention to the training of special arms. There are many of these, and the States could obtain excellent results with them in more than one way. The Militia is, by reason of its character and composition, especially adapted to provide these branches of the service, which are inestimably valuable to a campaigning force. They would have to be carefully regulated, however, since the great danger with such independent forces is that, by lack of interest or enthusiasm, or by an unfortunate choice of officers, they might fall below the proper standard of efficiency.

No one can question the great value of the services rendered by the engineers. Perhaps, without exaggeration, the West

Point Academy might be said to have decided, next to the navy, the result of the War of 1812. During the critical campaign of 1814, the West Point Engineers doubled the capacity of the little American army for resistance and introduced a new and scientific character into American life.

Military sanitary organization has become a recognized entity, and has a clearly defined military status in all of the great armies of the world; it is not alone a question of doctors, ambulances and stretchers, but of men, material, in fact, everything that pertains to any other military organization. Some States have made commendable efforts in this direction, but it is not enough to have regimental medical aid alone; provision ought to be made for the proper medical forces and stores to accompany brigades, divisions, and corps.

In the matter of a Quartermaster's Department, especially in transportation, no system has been adopted or any measures taken to provide for one in case of need. Among other departments to which special attention could be paid by the Militia may be mentioned signalling, cycling, railroading, transmission of messages, and submarine mining. The question may arise whether such special arms could not be taken from the fighting effective. Experience says not, but rather that these should constitute a regular corps whose duties pertain to the various special services and who are properly trained in their duties.

The correct performance of administrative work is a necessary qualification of a good force. In this line more than in any other our Militia system is peculiarly deficient. The loose and confused system may even open the way for dishonest dealing. In the War of 1812, besides its military disadvantages, the Militia service was tainted with fraud. Habitually and notoriously, in New England and New York, the Militia men when called out attended muster, served a few days in order to get their names on the pay roll, and then went home. The United States Government wasted millions of dollars in pay and provisions for such men.

The Administrative Departments exist only in name in most States, but no good force is possible without them. Of what good are troops that are poorly armed and equipped from an inefficient Quartermaster's Department, or cannot be got to the point when their services are needed? Or, having secured transportation, are unfed, or have food of such quality or irregularity

of issue that it amounts to the same thing—owing to inexperienced or inefficient Commissaries of Subsistence? What results such neglects lead to we can learn from the reports of the service preformed by the California National Guard in Sacramento during the railroad strike of last summer. The men reported promptly, but were ill-fed and subject to delay, and no proper means were taken to obtain provisions. No efforts appear to have been made during the seven days in camp to provide rations, and nothing was done to make the command independent, the troops being sent to the various hotels and eating-houses for their meals. The troops were destitute of many things that go to make up the equipment of the soldier. There were absolutely no commissary stores and in some cases the officer in command was obliged to purchase shoes and clothing. At one time in Sacramento the Major General Commanding gave his personal guaranty in order to feed a portion of the troops. These neglects will not be remedied until some other than the present system of staff appointments comes into vogue. To fill these positions men must be selected with the requisite technical qualifications, men whose civil occupation is in the line of their military office, and they must not hold their positions at the caprice of a partisan political administration. In the paper work and the necessary records to be kept, great ignorance is manifested in nearly all the Militia organizations. It would seem as if there were no excuse for this shortcoming, since such routine paper work is simple and could be learned in a very short time. Any training is imperfect and incomplete which does not properly develop the administrative services and impress upon all officers the absolute necessity of having them in a state of efficiency when troops take the field.

A good force should be well drilled and disciplined. Owing to improved weapons a higher education of the individual is now more necessary than formerly, because lines of battle have become widely extended, and the individual must therefore be taught to rely largely upon himself, and at the same time be able to act as a part of a great body and in unison with it. Military drill is intended to instruct the man in certain movements and duties for his greater efficiency as a soldier acting with others, and to develop a certain power of physical endurance. The latter object cannot be obtained by a system like that of the Militia, in which the little time which is devoted to drill must be given to the pursuit of the former object. Even for this the time is in-

sufficient. All efforts at improvement in this line must endeavor to gain more time, and to direct the instruction to the most important duties of the soldier. Too much attention must not be paid to trivial matters. It may take days to learn the precise execution of a brigade movement, which time might be applied to advantage in many other ways. Too much time is given to the individual instruction of the soldier in small-arms firing, which might give better results if partly utilized in giving practice in collective firing. The examples mentioned are sufficient to indicate the errors in this direction. How much drill would be necessary to make the average recruit sufficiently familiar with the drill for effective active service is a question that admits of comparatively definite determination, and authorities will not differ widely upon it; but how much is necessary to produce, in conjunction with the other conditions, an adequate degree of discipline, is a much more difficult question to decide. The lack of discipline, more than anything else, distinguishes bad from good troops. Measures must be adopted tending to instill and foster the spirit of discipline in the National Guard, and if this be not done the term "Militia" will be used as one of derision and opprobrium, not only by military men, but by the public at large.

In years past when the fighting was done by heavy masses of men, ignorant obedience and machine-like precision was all that was asked of rank and file. This is changed now. As armies are maintained in time of peace in order that they may be ready for war, it follows that they should be trained in those duties which will have to be performed when hostilities begin. Steadiness under fire, and calmness when threatened with danger, cannot be acquired in manœuvres with imaginary enemies, but almost every other virtue which a soldier should possess can be developed in this way in times of peace; and the administrative departments now so necessary to the success of a fighting force, can be brought to a condition of practical efficiency. The experience of seeing large bodies of troops assembled and commanded in proper manner gives an idea of the ultimate end and aim of all military instruction, that can be gained in no other way. The question of war service or the simulation of such service is of the greatest importance. One writer thinks that the Militia should be asked to volunteer for this duty, making it a necessary condition to their acceptance that they would consent to

come under the authority of the National Government and become subject to the orders of the officers assigned to them. Another argument in favor of manœuvres is that the monotony of drill, after it is once learned, will rapidly quench martial ardor. There must be some evident practical application of these rudiments to keep up interest in the Militia. No one will dispute that well-trained officers are indispensable to a good force, but military men say that green troops need more and better officers than veterans. In this respect the Militia differs widely from a good force. In military knowledge, the officers are, as a rule, but little above their men; and there are few who have any other professional knowledge than that contained in the drill book, in the pages devoted to company, battalion and regimental drill. We see here another bad result of the cheapening of military rank. The military talent of a State is all absorbed by the many staff appointments, and by the positions of regimental field and staff officers. The titles of the company officers are of utter insignificance where so many colonels abound, and on that account not much sought after. And yet these are the important positions in the Militia. What we chiefly needed in the war of 1861 and what we shall again need, is a large number of men to fill the grades of captain and lieutenants. Although it is desirable for men filling these grades to understand how to drill troops, it is still more important that they should have some knowledge of feeding, clothing, and marching troops, as also the general principles of military sanitation. It was lack of such knowledge which cost the nation so many lives from preventable hardships and disease. The lack of well-trained officers is in part due to the mode of their appointment. The elective system prevails in nearly all the States—indeed it is still imposed by specific clauses in various State constitutions,—and it has also been adopted by Congress for the Militia of the Territories. To eliminate as far as possible the evil features of the elective system whereby incompetent and unworthy men are sometimes elevated to office, all officers should be required to pass an examination before a board.

The question is sometimes asked by military writers, whether the United States should not furnish to the Militia all officers above a certain rank. The State alone is authorized to provide officers for the Militia, though the President may, when the Militia is in the active service of the United States, command



them through officers of appropriate rank. The higher the rank, the more difficult to fit one's self for it, and, in the higher commands especially, experience is necessary to efficiency. On that account it seems as if there should be some limit to the rank that can be attained by the Militia officers in time of peace. Rank should be commensurate with the command. Think of a State like Iowa, that has seven general officers, thirty-eight field officers, and 150 company officers to command 2500 men. It would be no more than just to limit the rank of militia officers to be sworn into the service of the United States, to that which corresponds to the command actually exercised by them in the State. Reducing the number of generals, and cutting down the top-heavy organization of the present day, would be a great gain to the Militia, in that it would return many an officer to a rank which he may be fairly competent to fill, while in the higher offices he may be entirely inexperienced and incompetent. Ordinarily, militia officers are enthusiastic and anxious to learn, but the opportunity to do so is lacking. There are no military schools open to them and few States provide military libraries for the use of their officers.

The equipment of the Militia leaves much to be desired, and shows a diversity which would prove disastrous if the troops of different States should serve together in the field. Uniformity of arms to be used by soldiers when ordered out for any duty, may be said to be a military necessity. It needs no further argument to show that the general government should furnish arms and ammunition. As the army is now changing its rifle for one of a smaller calibre, this would seem to be the proper time for the Government to promptly replace all old guns and ammunition in the hands of the Militia with new material. The intrenching tool is now considered in all armies as not only a part of the equipment of the soldier but as one of his weapons. This should also be issued by the Government, as well as all articles usually designated as Ordnance Property. The State troops will probably long maintain showy dress uniforms for purpose of display, and, except in regard to cost, this is considered by some as rather advantageous. But their fighting clothing, the undress, should be uniform with that of the United States for convenience of administration when called into the service of the United States. To prepare for this and also to effect a great saving to States, in times of peace, the general government should sell certain

articles of clothing and equipage, such as uniforms, overcoats, blankets, knapsacks, etc. A good system of keeping accounts and rendering returns, adapted for this purpose, would also serve to teach this important branch of administrative routine.

Our army is relatively to population the smallest in the world, and is almost unique in being entirely without reserves; it is kept small on the avowed principle that it is to serve merely as a nucleus in time of danger and as a training school for officers. This would imply that there were reserves to strengthen the army and to coöperate with it. The Militia in some States possesses much merit, but it is not a force which can be properly called a national reserve for the army; for a national reserve for military service, to be efficient, must be closely connected in organization, training and command with the standing force, and it cannot be a separate and independent body. As at present organized the Militia is not a reserve for the army, and it is hardly an auxiliary force in the proper sense of the word. There are forty independent forces which are under no real national supervision or control; and these forces are organized and trained entirely without regard to national needs and without any idea of coöperation with the army. This is the most important defect of our present military system, a defect which is yearly becoming more and more serious as men possessed of war experience acquired in the Rebellion pass beyond the age of active service. It is an utter lack of systematic method of creating a trained reserve, and, in fact, of adaptability to any organized and effective form of expansion on the outbreak of war.

## MILITARY DUTIES IN AID OF THE CIVIL POWER.

BY CAPTAIN JAMES REGAN, 9TH U. S. INFANTRY.

IT is well understood among us that the military branch of the Government is not to be called out or used in the civil affairs of our country except as stated under Art. IV., Sec. 4, of the Constitution, which authorizes the army and navy to be employed to protect a State from "invasion" or "domestic violence" only by the order of the President, based "on application of the legislature, or of the executive when the legislature cannot be convened." It is evident from this that a military officer whatever his rank, at his own option or on the direct request of the civil power, has no authority to furnish troops to aid in making arrests or establishing law and order, nor has he in any event, the power to order his men to serve as a *posse comitatus* to a *sheriff* or other civil official whose function it is to execute the local laws of a State or Territory. But it has been held—and it is well to keep these distinctions in mind—that the troops may be used under the orders of the President: 1. For the execution of the laws for the protection of civil rights (R. S. Secs. 1984 and 1989); 2. To keep the peace at elections (R. S. Sec. 2002); 3. For the removal of intruders and unauthorized persons and things from Indian country, and suppressing hostility between Indian tribes (R. S. 2151-52); 4. For officers to act as Indian agents, to aid in taking the census, and the execution of the quarantine laws (R. S. 2062, 2190, 4792); 5. For the custody of extradited persons (R. S. 5275); 6. In executing the neutrality laws (R. S. Secs. 5287-88). These are positive legal provisions, and easily comprehended. Everybody is aware of the maxim that ignorance of law does not excuse. Therefore, as an officer may be ordered out with his command at a moment's notice it behooves every officer of the army to know positively the full scope of his duties and to keep within their legal bounds. When the critical time is at hand and the military must go forth to quell the mob and enforce the laws, the order for their movement comes from the President direct or through intermediate commanders, generally

the latter way. During the riots of 1892, the troops in the North and Northwest were ordered out and this case is *apropos*. I will again briefly cite the manner in which this was done, as it will serve to present the idea in a practical way: The Governor of Idaho appealed in a formal way, for the aid of the general government to suppress the reign of terror of the miners. The President was at Saratoga when he received this call, and without delay sent a message to the Secretary of War as follows: "You will at once send an adequate force of troops from the nearest station, under an officer of rank and discretion, with orders to co-operate with the civil authorities in preserving the peace and protecting life and property."

As acting Secretary of War, General Schofield immediately acknowledged the President's telegram, and, at once, wired the commanders of the Departments of Columbia and Dakota to send the necessary troops, who likewise telegraphed to the post commanders. Here we see the military chain of responsibility in its perfection, from the Commander-in-chief, through to the junior commander.

Of course orders of this character do not come to us, I am happy to say, except at very rare intervals. None the less we, whose special business is that of soldiering, should be up to the highest mark of efficiency, and should have the field equipment in perfect order and packed in such a way that it may be shipped without unnecessary delay. That of the company should be in the company store room; and the field or railroad ration should be ready in the commissary department ready for issue. These are but minor details but it is of the utmost importance that they should be understood and attended to. We have seen that orders for the duty under consideration come to us from the highest authority. Now when it reaches the commander immediately charged with its execution he must act decisively. Let us here consider in a cursory way the preparations necessary to meet the emergency. The commander of the post issues his orders to the troops, based upon that of the higher authority in form, briefly stated about as follows:

Pursuant to orders, etc., etc., the troops of this command will be ready to leave the post at — o'clock, January 1st, 1894, fully equipped for field service in accordance with regimental orders.

Each man will carry four days' cooked rations, canteens filled

with coffee, and one hundred rounds of ammunition, a reserve supply of one hundred rounds being carried by each company.

The Subsistence Department will prepare in bulk, neatly and compactly packed and marked for shipment, ten days' field rations to be issued on ordinary returns to each company.

The Quartermaster's Department will furnish the necessary transportation (which of course is determined by the number of men and character of movement).

To expedite matters copies of this order are sent, without delay, to the company commanders, and the officers concerned, *i. e.*, A. A. Q. M., A. C. S., Ordnance, Signal and Engineer officers, and the post surgeon. Upon the receipt of this order the A. A. Q. M. will, at once arrange for, or get the transportation in order, and will see that the requisitions on his department are duly issued upon. By his quarterly account of stock he should be able to decide what is necessary to meet the present and prospective requirement of the troops, and make his requisitions accordingly. If he does this and the articles are not supplied he will have performed his duties and will be blameless. The duties of the A. C. S. are not as complicated as those of the quartermaster, but still as far as they go, they are very important, as was demonstrated during the riots of 1892, in the lack of proper and adequate supplies of food to the National Guards. Unlike the quartermaster, the A. C. S. is required to take an account of stock monthly, so there is no excuse for him if he fails to require for the supplies necessary to keep his supplies up to the most efficient mark. The articles designated for troops in the field or on campaign, happily are not of a perishable character and can generally be kept in store without detriment to the Government. In looking over an order published in a Western department I found the following data which is *apropos* here, *viz.*:

#### WEIGHT OF 100 RATIONS:

Bacon in sacks . . . . .	76 lbs.	Sugar in sacks . . . . .	15½ lbs.
Fresh beef or mutton . . . .	125 "	Vinegar (1 gal.) . . . . .	9½ "
Hard bread . . . . .	132 "	Candles . . . . .	1½ "
Beans, in sacks . . . . .	15½ "	Soap . . . . .	4½ "
Coffee, ground . . . . .	10½ "	Salt . . . . .	4½ "
Coffee, R. & G. . . . .	8½ "	Pepper . . . . .	.46 "

This table furnishes ready data for computation. The travel ration, as it is styled, is furnished for troops travelling by cars, stages, transports, or otherwise than on the march, or when for short periods they may be separated from cooking facilities. The

Commissary should be able to furnish all data as to weights, etc., relative to the different rations. On being packed for service the stores should be carefully verified and suitably packed. The post ordnance officer is seldom called upon to do anything in these affairs except by times to scan the requisitions and note thereon of the articles called for, those that can be furnished at the post. Still in an emergency, he it is, whom we seek when an extra supply of ammunition, etc., is required for the rifles and big guns; besides it may fall to his lot to take charge of the artillery, Gatlings, etc., of the command, in a word burnish, lacquer, and keep the powder dry. It behooves him, therefore, to keep in touch with his department which is one of the most particular and precise in the army, and be prepared to meet all demands on himself and his charge. As a rule the companies at the post have a reserve of ammunition in the magazine. The signal officer should look to his flags, torches and heliographs, in a word he should not be found with his lamps untrimmed. His detachment should be in that state of efficiency that all ordinary messages can be readily received and sent, and from the regulations in force this much is always expected. The engineer officer, as his office implies, may be charged with most important duties. Breast-works, barricades, piercing walls, a knowledge of dynamite and its uses—the weapon of the Anarchist,—the topography of streets or particular districts of cities and vicinity with maps, may properly be classed among his duties.

The surgeon with his assistants is an extremely important factor in emergencies of the kind under consideration, where life, limb, etc., are at stake. In looking over the recent developments of the Medical Department I find it is trying hard and successfully to keep abreast with the times. I shall note, as it is *apropos* here, what is expected of the surgeon when the troops are called out. He must have his detachment practically proficient: (1) in the drill of the detachment, which as far as it goes, corresponds with the school of the soldier, in single rank; (2) in the litter drill, proficiency in which is specially important, because when a man is wounded he should without delay be promptly and skillfully moved to a place of safety, away from the vengeance of the mob whose wrath and vindictiveness have impelled them to the most brutal acts, beating the heads of the wounded on the pavements of the streets. Take the Homestead riots of 1893 as a recent example, where a thousand people, men women,



and even children, sprang at their victims, showering kicks, blows from clubs and stones upon them as they emerged from the boat and on their journey. As the captives walked down the dusty streets with bleeding faces and halting limbs, many of them weeping and quaking with fear, they had to be supported to keep them from falling to the ground. They were subjected to all kinds of remarks and acts, the best people standing by, laughing, and encouraging the mob. The wounded must be cared for at all hazards, and each man of the detachment, 1, 2, 3, 4, or a lesser number should know his place and be thoroughly instructed in all the duties incident thereto, interchanging places when necessary like a gun detachment. The directions in the Manual are ample to meet the ends in view, the handling of the litter and carefully placing the wounded thereon, also the carriage of the litter and the passing of obstacles. The improvising of litters from camp cots, window shutters, doors, benches, boards, ladders, etc., is important as these articles are generally obtainable, and so too the carrying of the wounded without the aid of litters. The ambulance for the sick and wounded should from time to time be carefully inspected,—in a word it should be ready to roll out equipped for service at a moment's notice. First aids to the wounded is of the utmost importance and the instructions here, both theoretically and practically, should be most perfect. What is here pointed out in a cursory way are strictly within the professional duties of the medical corps and being of the most important character the highest notch of excellence should be the objective of our friends in need.

So far I have in brief considered the duties of the staff now for the time. The order for the move is communicated to the company commanders. Irrespective of orders, however, the units of military organization should always be ready, and as a rule we generally find them so. The rules requiring and insisting upon the theoretical and practical instruction of officers by means of the lyceum, the examination for promotion and the periodic practical requirements under the eye of the inspector are, in my opinion, excellent toward keeping officers and their commands effective. In cold countries, however, the deprivation of a proper place to drill and exercise in, is seriously felt. What a contrast there is in this particular between the company at this post and the independent national guard company in the city of Oswego, where there is a spacious armory in which a good sized company

can easily be manœuvred in all the movements of the squad and company. There is no excuse for a regular company found unprepared to meet a call to arms. It is expected to be effective at all times; and everything is on hand or in the company store-room, except the railroad or field ration which we have seen should be on hand in the Subsistence Department. The careful officer who has the welfare of his men at heart, will make a careful inspection of all details and will see that the dress of the men are adapted to the season and duty in view. The following suggestions affecting the equipment of a company for the field may be found of importance, especially for reference.

Equipage: Tents, etc. See current clothing and equipage order.

On the march or in the field the following articles should be carried by each man. Cap, overcoat, blouse, trousers, pair of new shoes, overshirt, two undershirts, two pairs of drawers, two pairs of socks, pocket looking-glass.

In blanket roll, when used, of the above articles, skull cap, undershirts, pair of drawers, pair of stockings, two towels, comb and brush.

In addition to the foregoing the following articles are carried: rifle complete, cartridge-belt filled with ammunition, haversack with not less than two days' cooked rations, canteen filled with coffee or water, meat-can, tin cup, fork, knife and spoon.

In affairs of the character under consideration the National Guard are also called out and their methods differ somewhat from ours. I shall here refer to them, briefly. The governor like the President when the occasion arises has the power to call out the guards, and under certain conditions the military officer in direct command may do so.

There is a regular form of precept duly tested to be made by the sheriff, or other civil officers in these cases, calling out the military power. Of course this precept can be varied to suit the circumstances of each case, and it operates in its way like the before quoted order of the President to his military subordinates. The national guard officer to whom such precept is directed must respond to the same with his command fully armed and equipped, and upon arrival at the scene of the riot or disturbance must perform his duties under the law. The riots of 1892 demonstrated with what admirable precision and quickness the guards can be assembled. In consequence of the numerous rail-

road riots within the last few years the national guard officers have gained a great deal of valuable experience, and are therefore prepared at a moment's notice to act promptly and decisively to maintain the supremacy of the law and put down riot and anarchy. In passing I shall call attention to the following important points :

A reserve of ammunition should always be on hand stored safely in armories, and to this end timely requisitions should be made as required by regulations or orders. If the requisite ammunition is not on hand it should be purchased in open market, ammunition or no ammunition the troops are required to obey an emergency call.

Happily now the guards are as well off in the matter of proper dress as the "Regulars," whom in many ways they have closely copied, so what has herein been pointed out as proper equipment for the latter applies in every detail to the former. The full dress in an emergency is an obsolete idea,—what is needed is free action of the muscles and joints and this is fully secured by the army undress, or campaign uniform which of course includes the thimble belt, leggings and campaign hat. The men should be never over-loaded so that every superfluous article should be discarded,—in a word, the kit and dress should be adapted to the season and duty.

In the matter of rations and supplies the guards are governed by the regulations of the State, but judging from the criticisms of the past the provisions to meet this important requisite have been sadly deficient and for this reason should in future command the closest attention on the part of the officers of the national guards. The nearer they approach the system in the Army in this particular the better it will be, as it is simple and adequate for all demands. The soldier's food is of the utmost importance. It was Napoleon, I believe, who said that "soup made the soldier," which means that a soldier must, at all times, have food enough to sustain his vitality. The officers, therefore, especially those in the subsistence department, should anticipate and provide for this important requisite. Never start on an emergency duty without rations of some kind,—hard-tack and bacon, you know, do not easily spoil, of course ordinarily they are not as palatable as boned turkey, but all the same they are sweet to the hungry campaigner. I deem it proper here again to call attention to the field and railroad ration previously referred to.

A quantity of these stores should be stored in the armories, or it should be pre-arranged to have them sent there at the first mutterings of danger. Liquor not being necessary as a refreshment should for obvious reasons be rigidly tabooed.

After the preliminaries just explained the troops should be ready at a moment's notice to fall in at the sound of the "assembly," or in a word to take up the line of march. The result of the roll-call having been reported by the 1st sergeant, is the time for the final and careful inspection. Details should be closely looked into and all deficiencies at once supplied. Do not perform this duty in a careless way, so that Tom, Dick and Harry may have an opportunity to say when it is too late, O, Captain, "I forgot my great coat, canteen, haversack," etc. If necessary have a check list or memorandum for reference. Having taken up the line of march it is well to understand that the United States forces or any portion of the national guards, parading or performing any kind of duty according to law, have the right of way in any street or highway through which they may pass, provided, of course, that the carriage of the mail, the legitimate functions of the police, and fire department are not interfered with.

It will be found in the end that the laws afford the necessary protection to officers and their men in the due and lawful performance of their duties. In many particulars, especially in the call to arms, the Regulars have the advantage of the Guards, because the former march as one man from their barracks or post while the latter in assembling must first reach their armories, and in doing so may have to run the gauntlet of the mob; of course the local laws prohibit their molestation while *en route*, but what do the lawless or the mob care for such laws, the anarchists, their friends want chaos or the destruction of all law and order,—their death cry being "vive la anarchie." The assembly of the Guards is a matter of considerable labor. The dwelling places of the men are known to the non-commissioned officers who are furnished with "alarm lists," and are, in case of sudden peril, required to notify their squads, sections, etc., individually. The men thus notified are required to proceed, at once, to their respective rendezvous in civilian dress, and equip themselves for service. The routes by which the men may reach their armories are of great importance; the orders on this subject should be explicit and utmost secrecy enjoined.

While on the march to the scene of the riot or disturbance, every precaution should be taken,—advance, rear and flank guards should be thrown out when necessary, the method of handling such guards being fully explained in the Drill Regulations and in Captain Wagner's recently published work, "The Service of Security and Information," with which, theoretically and practically, every officer should be familiar. Do not wait until you are called out and then hastily look over such works. Master them at once. You know the *old grind*, "for the want of a nail the shoe was lost, etc." A strong force of well disciplined policemen sometimes makes an excellent advance guard. The order for the direction or line of march should be explicit and should be thoroughly understood by all subordinate commanders. The line of march of the main body is generally through the broadest avenues or streets, the flankers when necessary, marching along parallel thoroughfares. The formation of the troops should be such as to clear everything before them, *i. e.*, from curb to curb, and beyond to the houses, as the side-walks should not be left to the mob to threaten the flanks of the troops. In a word march quietly without music, and thoroughly protect the column.

It is an important duty of a detached commander to give his men clear and circumstantial instructions as to how they must act in every case, tactically and otherwise,—there must be no doubts. The square, the street column, the movements incidental thereto, and many movements in the extended order drill may be used to advantage. Tactical movements, however, on account of the variety of possible situations, must necessarily be left to the judgment of the immediate commander. If I permitted my fancy full scope my essay might become quite as long as my treatise on the same subject. There are numerous details, therefore, I shall pass over without comment; but before quitting this part of my subject I shall refer briefly to the duties of the officers.

The main thing for officers and men is to keep within the strict legal bounds of the law. I find on looking over this subject that the law allows a wide and wholesome discretion,—for example take the opinion of the court in the case of *Iam*, which vindicated and sustained the acts of the officers in awarding summary punishment against this mutinous soldier; other cases might also be cited. A wise common sense, backed by a little prudence, is the great essential, because while the laws

of the several States give a wide discretion to the military power, they do not relieve the officers from liability to prosecution in criminal and civil suits, as was attested in the cases of Colonel Streator and other officers in the Riots of 1892. The main things are, to know your duty in advance, to have confidence, and to obey promptly all lawful orders. Use no unnecessary violence, and use just enough force of the proper kind as will accomplish the object in view. Above all keep your temper and a "*level head*." The commanding officer, and every subordinate commander, should, when possible, have a map of the place and make himself thoroughly familiar with his surroundings, offensively and defensively. A practical knowledge of "hasty intrenchments," or extemporized shelters on the part of the officers and men would not be out of place. It might prove of the greatest importance to the soldier to know how to prepare his rifle-pit, which is simply a shallow trench, the earth from which is heaped upon the side towards the enemy, sufficiently to screen the soldier from view. Circumstances will inform you when you have your mound high and broad enough to meet the condition,—root or die is incentive enough. It might be necessary to break through walls or blow up structures, in a word provide against all contingencies.

Having arrived at the scene of the riot or in the disturbed district it behooves every officer and non-commissioned officer to keep his wits about him because a misstep might result disastrously. It has been properly said that the period of argument and entreaty should be left to the magistrate, or civil officers, that of action to the troops; but unfortunately for law and order the former, in the past, has been carried too far. Action in such cases should be quick and decisive. When the military steps in the civil power must fall back. The Regulars having arrived on the ground remain under the directions and orders of the President, as Commander-in chief, and his military subordinates. They are in no way under the direct orders or exclusive disposition of the Governor of the State or the civil or military officers of the State. As a general rule "the instructions of the civil officers are given in general terms, directing the military officer to accomplish a particular purpose, as to disperse rioters, or clear a place, or defend a building; but the mode and means by which the specified object is to be attained are directed by the military commanders." Before any decisive move of the military, the commander of the



troops should request the civil officer whose duty it is, to give notice in a loud tone of voice, commanding all persons to disperse forthwith; of course in the absence of such officer this duty would devolve upon the proper military officer. "The most effectual means should be taken for notifying beforehand, and explaining to the people that in event of the troops being ordered to fire, their fire will be effective." After waiting a suitable time, the troops should advance and attempt to clear the place or disperse the mob. Now is the time for wise exercise of common sense, patience and intrepidity.

In my essay of last year I showed that the troops sometimes act under martial law and sometimes simply as an armed police force. In the latter case their duties are more delicate than the former and they act in conjunction with the civil officers, but in the latter case the military power is supreme and the laws of War, as laid down in General Orders No. 100 of 1863, as far as applicable, are in force. In any case, however, it is evident that when the troops are attacked, or resisted, so as to be unable otherwise to clear the ground or disperse the rioters, they may fire, or use any other means necessary to attain the end desired; but in no case, except in self-defense, should the troops fire without orders from the commander on the spot. The commander should exercise a humane discretion as to the extent of the fire so as not to sacrifice life unnecessarily. At times, a great deal may be accomplished by picking off the prime devils or leaders, designating your good shots for this purpose. The control of fire is an excellent feature of our new "Drill Regulations." When the fire is ordered let it be directed to the front and at the feet of the rioters: by this means the boldest will be laid *hors de combat*, and the curious and rabble in rear may retreat. There are numerous details relative to the fire and other subjects which might properly be cited here, but the following practical lessons from the Riots of 1892, forcibly point to the difficulties the troops must be prepared to encounter, and with what patience and fortitude they must be met.

A lieutenant and five men of the —— were making a tour of outposts or pickets on an engine, which was going at good speed, when a non-union man who was in the act of throwing a switch for them was attacked by the rioters. The engine was quickly reversed, and the soldiers jumped from the engine and charged the rioters. The lieutenant called to the strikers to throw up their hands and advance one at a time; the answer was a

bold defiance, and drawing their revolvers they fired at the soldiers. It was five rioters against five soldiers in the web of tracks. "Fire!" commanded the lieutenant, which being promptly obeyed, the rioters yelled and returned the compliment. Again the rifles rang out, mortally wounding one rioter; the others continued to retreat but were soon overhauled and captured. They were taken to police headquarters under a sergeant who was in the fight. The police captain held the sergeant, but forcible release being threatened the sergeant was sent to camp. This affair caused a great deal of feeling between the policemen and the soldiers, the former not realizing that for the time being they were subservient to the military, and that they had no right to arrest a soldier while in the performance of duty.

In another affair seventy-five strikers gathered on a trestle, jeered and swore at the soldiers: a company was ordered out, which with bayonets fixed scattered them. An hour later they gathered again, and throwing stones badly injured one of the sentinels. The trumpet sounded to arms, and two companies on double-time drove the strikers into the arms of the policemen, who used their clubs with serious effect. The people in the vicinity in full sympathy, hooted and insulted the soldiers. They refused to sell them food and would not allow them to draw water from the wells.

At one crossing a mixed crowd of over one hundred men and boys gathered around the soldiers and commenced to jeer them, and press them closely. They even tried to wrest the pieces from the sentinels' hands, and in another case knocked a sentinel down with a stone. The guards and sentinels at many points had to be doubled.

The troops had to be habitually on the alert to thwart the plots of the strikers to destroy valuable property, especially a large coal trestle which cost \$75,000.00, which they tried to destroy by setting fire to a house near by. They would skulk through the yards and among the cars, and fire stones and revolvers at the sentinels and guards, but they generally received a threefold reply. Sentinels had to be doubled to keep them from setting fire to the cars; one of their plans being to apply a match to the axle boxes.

The saloons were ordered closed by the police authorities and to enforce this regulation soldiers were frequently ordered out. In one case of this kind, a saloon keeper declined to close his

place; the corporal of the squad made a lunge at him and pinned him to his own bar; he called for quarter and was glad to close his store.

The engineers in sympathy with the strikers would open the valves of the engines as they passed sentinels and covered them with boiling water. I think a case like this should meet with the severest punishment. An engineer guilty of this outrage and indignity should be shot from his cab. Orders were frequently given to sentinels under critical conditions to shoot to kill.

In civil disturbances like those at Buffalo forbearance on the part of the soldiers is absolutely necessary, but this virtue at times is carried too far. This was the case at one of the bridge crossings where the mob jeered and cursed the soldiers on duty, believing they might do it with impunity as the soldiers dare not fire. They became so bold that finally repressive measures had to be used; the troops were ordered to charge and keep on charging, until the street and bridge were cleared, and if necessary to use steel to the muzzle of the gun.

At another point the rioters would retreat just beyond the points of the bayonets. The captain of the guard ordered them back but they only laughed and jeered at him, one of them said that he was an American citizen and that the captain could not make him move. Another man set his bulldog on the soldiers. They were abetted by women and children. Numerous other instances might be cited but the foregoing furnishes variety enough for reflection.

From what I have said it is evident that our duties in aid of the civil powers are of the most delicate and serious character, and with anarchy in the land and other senseless combinations forming, diametrically opposed to the principles of the Constitution, who can predict how long or how short the time will be before we are called upon to perform these duties. My hope is, never, but keep the maxim at heart, "in peace prepare for war."

## THE DEFENSE OF OUR FRONTIER.

BY COLONEL JAMES M. RICE, ILLINOIS NATIONAL GUARD.

FOR the past few weeks the people of the United States have been extremely interested in the morning telegraphic news in their daily papers.

The tone of the official correspondence, between our country and England, has been at times such as to indicate a possibility of an immediate declaration of war. While we have great confidence in the wisdom of the rulers of these nations, and believe they will not resort to arms if their differences can possibly be adjusted in any other way, we sometimes fear the little State of Venezuela may not fully realize the gravity of the situation, or its hot Spanish blood may not stop to count the cost, and it may by some overt act, precipitate the conflict.

With these dangers in mind, our people cannot do otherwise than think earnestly of what the consequences of a declaration of war would be.

Would the fighting begin on this side or on the other side of our Northern frontier? Whose fields and whose commerce, whose houses and homes would first feel the iron heel of war? All Americans have full confidence as to how it would end, but the question is, at what preliminary sacrifice on our part, and how would it begin and where?

There are only two members of the regular British army stationed in Canada, but that dominion has a most excellent volunteer militia, four times as numerous in proportion to the population as is the volunteer militia of the United States, though in the aggregate not more than one-third as strong.

The Canadian militia are well drilled, well armed and equipped, and well commanded, and are so located all along the frontier, that they could be brought into action on a few hours' notice. Those who are wise and have visited them in their homes and armories, and are acquainted with their personnel will not fail to have a high regard for them, as soldiers.

On this side the line we have the National Guard and we cannot give away any military information, in publishing something

about them, for we may be sure the British War Office has as accurate knowledge and full statistics concerning them, as we have.

East of the 100th meridian we have in round numbers 100,000 volunteer militia, which, for convenience, will all be included under the most common name of the National Guard. They are all under a state of discipline that is classed by military men, as excellent, very good, good and fair, with the exception of two or three States, where they fall below even the lowest of these classifications. It is gratifying to know that the best discipline is generally found in the larger States, so the proportion of the Guard that could be classed from good to excellent is large. They are practically all armed with the Springfield breech-loading rifle, calibre 45, sighted to shoot 2000 yards, and effective at two miles. It is the same rifle the Regular Army used until within the last year or two. These troops are all located at stations reached both by railroad and telegraph lines for, as a general rule, the States will not muster in a company, not so situated, and as a consequence they could be assembled at very short notice. The Adjutant-General of one State reports that he can have his entire National Guard ready to board the cars in two hours of daylight, after receiving the order to do so. From there it will depend upon the speed of the express trains, to determine when they will reach a given point, armed and equipped and ready for action. I would not say that two hours is enough to assemble a company, though I saw it done, at one time, when 68 men out of 73 were in the armory and in uniform, ready for action, two hours after orders were received from the Governor, and that was in the beginning of the National Guard's history, before they had devised and put into effect the efficient methods for assembling they almost all, now have. Four of the men arrived a few hours later.

From four to six hours is an abundance of time to assemble every company in a State, at their respective railroad depots, and while they might not be fully supplied with all that is desirable for their comfort, they would be able to take care of themselves fairly well, with what they could find en route, and have ordered to meet them on the way, or at the place of destination. From the time they assembled, they would be for all practical purposes a part of the United States forces. The President would not have the right to disorganize them or reorganize them, but in every other respect it would be his duty to treat them as a part of the Volunteer or Regular army, and expect a like service from them. It would

devolve upon him to order them wherever the good of the service might require, within or without the territory of the United States, and in all respects to care for, supply, pay and use them as a part of the military forces of the United States.

There is not a particle of doubt but what the President could assemble one hundred thousand National Guard men at any railroad centre, east of the Mississippi River. They would commence to arrive within from four to ten hours from the time the President telegraphed his orders, and would continue to arrive at the rate of 25,000 a day, until all had arrived.

While there would be a few who would have to be excused, there would be more than ninety per cent. of the men, whose names are now on the rolls, who would be ready to leave home, with their companies.

There is one good feature in connection with the National Guard, that is not always thought of; where a company has been organized for some years in a locality, there are probably as many men who have served their term of three or five years and retired, as there are names upon the rolls, and in case of a threatened attack on our frontier, the most of these men would drop back into their places, as naturally as could be, all drilled, disciplined and acquainted with their officers, and without any loss of time, so that if desired, the companies could be increased to the maximum, as fast as arms, uniforms and equipments could be supplied, and they would do some good service, at the point of destination, while their uniforms were being forwarded, if the Government could supply the arms and equipments.

When Major General Snowden concentrated a part of his Pennsylvania Division at Homestead, he received orders from his Governor, after ten o'clock Sunday night. In thirty-two hours he had his troops concentrated at Homestead and placed in position, although a large part of that time could not be used. The order was received Sunday night, the worst night in all the week, when the telegraph operators had left their offices, so that it was impossible in many cases to have orders delivered until eight o'clock Monday morning. Owing to the feeling of hostility in some parts of the community, it was necessary to proceed with great caution, for fear of the trains being wrecked, and for the same reason on arriving at the point of destination, it was not deemed wise to place the regiments in position until the return of daylight. Thus the Second and Third brigades, a force of 5378



men, arrived at their destination within thirty-two hours after the commander-in-chief issued his order.

The first brigade was held in reserve in another part of the State, to watch and guard other points.

These troops could have been concentrated at Niagara Bridge in the same time, for in case of threatened invasion, there would be no fear of wreckage of trains by disaffected people, and a few miles more run would require no more time than he had to spend waiting for dawn. If they had arrived there before the bridge had been destroyed or the position occupied by hostile troops, they could have been stationed at either end of the bridge, for when properly ordered by the President of the United States, national boundary lines would prove no obstacle to the National Guard.

There are 100,000 such National Guardsmen ready to move with promptness, and 150,000, if the discharged men are reenlisted. As a mere geographical proposition, it is not far from Niagara Bridge to the Welland Canal, and the walking is generally good, but we may be sure it would not remain good for United States soldiers long, after a declaration of war.

There may be some enthusiasm in all this, but it is in the National Guard, and not alone in the writer, and he who reckons without including this element of enthusiasm, in such a cause, reckons without his host.

My paper on the National Guard, published in the *JOURNAL* for September, 1894, called out a rather severe criticism upon that organization from Lieut. Wm. E. Birkhimer of the Regular Army. Lieutenant Birkhimer in speaking of my "successful," as he admits, "vindication of the right of the general government to order the militia beyond the frontier," says, "but upon this point the essayist might well have saved himself the labor of his, it is believed, unanswerable argument." It seems to me it would be hard to find a service one could render his country more worthy of his labor than to assist in making 108,000 soldiers available for its defense by removing from their minds and from the minds of the officers of the general government and of the people all scruples, if any really exist, as to the right and duty of the President to order the National Guard, in the service of the United States, beyond the frontier to repel invasion. It is most true, that the officers of the general government, in the language of Lieutenant Birkhimer, "must know that its troops are not restrained by such scruples before it dare bring them into the pres-

ence of the enemy. To adopt any other course would be to court disaster." Is it not a valuable service to remove these scruples, or, as in this case, to show that they do not exist? A long step has been made towards success when such a severe critic of the National Guard admits that the right to order them across the frontier has been successfully vindicated and that "the argument (in support of that position) is unanswerable."

The discussion may now proceed upon the basis that the general government has the constitutional right to order out the National Guard of all the States and to order them across the frontier, if necessary, and the only objections that remain to relying upon this organization as an important element of defense are the scruples supposed to exist in the minds of the National Guard themselves, and the general inefficiency of that body.

As to my use of the word "National Guard" to which Lieutenant Birkhimer objects it is the name adopted by my State (Illinois) and many others, and it seems absolutely necessary to have some name other than "militia" by which to designate these voluntary military organizations of to-day, for the word "militia" has been so misused by applying it to the temporary levies in mass, of undrilled, unorganized and undisciplined citizens, that some new word must now be adopted to avoid the error into which Lieutenant Birkhimer has so lamentably fallen.

I showed in my original paper that these volunteer military organizations were the proper constitutional militia, and that the mass of the people when unorganized and undisciplined were only material out of which militia might in time be made. Notwithstanding this, Lieutenant Birkhimer, after asserting that he prefers the name "militia" and shall use it, directs the force of his criticism almost exclusively against these undisciplined masses and omits almost entirely to say anything at all concerning the National Guard and kindred organizations, about which my paper was written. These volunteer military organizations are called by other names in some of the States and I mean no disrespect to them and their name when I include them all under the name "National Guard" for convenience. No better illustration than Lieut. Birkhimer's paper could be wished to show the necessity of the use of the name National Guard, or some special name for this special organization. If he had used the name National Guard, the non-applicability of most of his adverse criticism would have been apparent to him.

There had been such organizations in England long before and at the time of the Declaration of Independence, and they had at that time begun to exist in the more populous parts of the colonies. John Hancock, whose famous signature to the Declaration of Independence can never be forgotten, was the captain of such a company. These companies had grown during the first stages of American independence, but until after the Civil War, they had been over-shadowed by the "Corn-stalk" and pioneer militia and had not amounted to much. There were as a rule only detached companies or battalions each under its own peculiar organization and by laws. After the Civil War they became infused with new life and became more numerous and better disciplined. They organized into regiments, brigades and divisions, and their new organization and development was recognized and provided for by state statutes. It then became necessary to adopt a special name.

For these volunteer military organizations I would myself have preferred some other name than National Guard. The name Volunteers would be good, but that would be liable to be confused with the volunteers who composed the greater part of the army during the late war. Volunteer Militia, Volunteer Guards, or State Troops would be very good names, but as the statutes of my own State and many others that have excellent volunteer military organizations, have named them National Guard, I have used that designation and must continue to use it until the Legislature gives us a new name. Besides the word "National" is not so much a misnomer as the Lieutenant seems to think. For the purpose of guarding our nation when threatened, they are as much subject to the President's orders as if they were already in the pay of the general government. Are the members of a company any less a part of a colonel's forces because they are under the immediate command of a captain? And are they any less a part of his available force because they are on waiting orders, or at rest in their tents or homes subject to instantaneous orders? So the National Guard may, by telegraphic orders, instantly spring into life and become a guard to the nation 108,000 strong, and ready for duty, drilled and equipped and knowing how to use their rifles.

Nor do I think scruples exist to any considerable extent in the minds of the members of the National Guard as to passing the frontier whenever they, being in the service of the general

government, shall be so ordered, and I am well acquainted with the sentiment of the National Guard. They would, indeed, be very much pained and chagrined to find that they were organized only to do police duty at home around railroad depots against American citizens. It is, I am sure, the most trying and unpleasant of all military duties to preserve order, to resist and quell a mob, especially when composed of neighbors and friends, to save life, if possible, and to take it promptly, if necessary, and, at the same time, to preserve discipline and efficiency in one's own ranks. This is, indeed, the very severest test to which any military organization can be put. But it is more trying to the militia or National Guard than to any other kind of troops. While the fact is greatly to be regretted that the National Guard is called upon to do this duty, it should not be forgotten that the very fact that the troops in this case are fellow-citizens and friends of the people composing the mob and only serving their country and preserving order as a matter of patriotism and necessity for the good of all, has a great tendency to take from the rioters that spirit of martyrdom and the exultant though sadly misguided sense of devotion to the cause of freedom and the people, they might feel if contending against a professional military force, from some far distant and unknown place, which had no sympathy or supposed sympathy with or for them.

If the National Guard understood that they were to be restricted to this unpleasant police duty against their fellow citizens, and to such defense of the frontier as the Lieutenant says they are capable of, it being at the same time impotent and ridiculous, enlistments in it would be very few in the future. But they verily believe they are subject to no such restriction and this belief is the pride and life of the National Guard.

Lieutenant Birkhimer compliments in highest terms the volunteers of the late war, and well he may, for, considering their unselfish devotion, the nobleness of their cause and the value of the Union they have saved, they composed indeed the Grand Army of Humanity, as well as of the Republic. But why compliment them at the expense of the National Guard, which was in the beginning officered almost entirely and composed very largely of returned volunteers?

Besides, the National Guards are volunteers, doubly volunteers, for they have not only volunteered their services in advance

of the call to arms, but have also volunteered to organize, learn the use of their arms, drill, discipline, and prepare themselves for action, almost exclusively at their own expense, so that on the telegraphic order of their President or their Governor, they are ready to take the field, 100,000 strong, armed, disciplined and equipped, and to move at once to the effective discharge of any duty that a loyal and patriotic soldier should perform.

The Volunteers of the late war, concerning whom no man can speak too complimentarily, were largely officered and drilled in the beginning by men who had been members of volunteer militia companies, though such companies were very few at the beginning of the war. The troops that first answered the Governors in response to the call of the President, were the few volunteer militia organizations in the States. In my own State the first capture of arms was made by volunteer militia organizations. The colonel and lieutenant colonel of the regiment in which the writer served, were, twelve days before this capture occurred, peacefully at home, a captain and first lieutenant respectively of a volunteer militia company, and Fort Sumter had not been evacuated, nor had the President issued his first call for militia. In that short twelve days these men had increased their command to a regiment, gone two hundred miles from their home, and with other volunteer militia had taken and held a strategic point and captured two steamboat loads of arms, when arms were so much needed, and, pursuant to orders from the President, had stopped traffic on the Ohio and Mississippi rivers. Both of these officers became major-generals before the close of the war. This would have been utterly impossible to these men if they and others with them had not been trained in this volunteer militia company. Such is the history of all the volunteer militia men I have known, and I have known many.

Lieutenant Birkhimer says, "Their short term of service soon carried them to the rear and to their homes." I cannot find figures to show what proportion of the few volunteer militia companies failed to respond promptly, or failed to see the conflict through to the end, but I venture to say that, if it could be ascertained, the proportion would be found very small. Only three such companies in Illinois returned to their homes when relieved as militiamen, and I have no doubt the majority of the men even of these companies returned to the service, probably

as officers of companies they had recruited. The other volunteer militia companies remained in the service, their numbers quadrupled by the accession of their friends, and only saw their homes again when they had marched by way of Cairo and Donnelson and from "Atlanta to the Sea" and back by way of Pennsylvania Avenue. At home they again took up the burdens and pleasures of domestic life, and were largely instrumental in founding the volunteer militia institution now called in my State and many others the National Guard. Such was the beginning of the National Guard. It is still permeated by the same spirit though to a great extent, sons are taking the places of their fathers.

Of one of the drilled militia companies, the Peoria "National Blues," existing at the outbreak of the late war and coming within the knowledge of the writer, the three commissioned officers all became full colonels. From among the privates came three brevet brigadier generals and one full colonel, being seven officers of the rank of full colonel or above in the Union army, three of whom lost their lives in battle or from wounds. The company furnished for the Union army thirty-five commissioned officers, and nearly every one who did not lose his life in the service remained in it till the close of the war.

Six hundred and sixty members of the Seventh New York which went so promptly to the defense of the National Capital, were commissioned in the service of the United States, holding rank from major general to second lieutenant, and excepting those who died on the field of battle or from wounds or sickness and except a few who are members of the regular army at the present time, they were all honorably discharged from the service.\*

A similar showing could be made in favor of almost all the other volunteer militia organizations. They have proven themselves to be the officers schools for the volunteer army.

At the outbreak of the Civil War there were about six companies of the regular army in Washington City that had been gathered there by orders of President Buchanan and Gen. Scott. On the 15th of April, the President called for militia. On the 16th the Sixth Massachusetts mustered on Boston Common; on the 17th, they embarked on the cars; on April 18th they reached Philadelphia; April 19th they fought their way through Baltimore and under great disadvantages, for they had been misinformed as

\* History of the 7th New York.



to the way in which they were to pass through the city and were taken through part of it in cars drawn by horses instead of being allowed to march as they expected. On the evening of the 19th they reached Washington City, four killed and thirty wounded and probably two or three times as many of the opposing forces killed and wounded.\* The Eighth Massachusetts reached Philadelphia on the 19th, where they found the bridges burned and communication cut off by the rebels. April 20th the New York Seventh reached Philadelphia and on April 21st the rebels seized the telegraph lines and all communication with Washington was entirely cut off. Owing to the opposition of the State of Maryland and the destruction of transportation lines and lines of communication, they were compelled to go by vessel and were so delayed that they did not reach Washington City until April 25th. The historian Nicolay, President Lincoln's private secretary, says: "With their arrival about noon of the 25th, all gloom and doubt, and feeling of danger to the capital vanished. In comparison with the un murmuring endurance that trudged through the Yazoo Swamps, and the unflinching courage that faced the dreadful carnage of the Wilderness, later in the war, this march of the 'Seventh' was the merest regimental picnic; but it has become historic because it marked a turning point in the national destiny. This was the first blood shed in the defense of the Union in the great Civil War."†

Although the National Guard of to-day and the old militia are governed by the same constitutional provisions, they are not organized under the same laws, nor organized in the same way, nor from the same material, nor surrounded by the same circumstances, nor are they under the same moral or legal obligations nor have they the same duty to perform. They are not the same kind of an organization.

Three kinds of organizations come under this same constitutional provision with reference to the militia. And the difference in the organizations may well lead one to different conclusions in the application of constitutional provisions to them.

In the early settlement of the country, as the pioneers were living among Indians that were sometimes hostile and sometimes friendly, it was necessary for each particular neighborhood to be able to defend itself on a moment's notice from an Indian out-

\* See "Outbreak of the Rebellion," by Nicolay, page 84.

† Nicolay's "Outbreak of the Rebellion," page 84 and following.

break, and when it occurred there was no time to look for help from any other colony or source, for no other colony was near and they had no facilities for transportation. The attack must be resisted successfully or the colony destroyed before help could come from elsewhere. Then whoever went out with such a colony in effect, if not in so many words, volunteered to turn out whenever necessary in its defense; and whoever afterwards joined a colony did so practically with the same understanding.

At that time hunting with the rifle was one of the important means of providing the family with food, and every man and most of the women and children knew how to use a rifle and use it well, and the old rifle, loaded and ready for action, always, or almost always, rested over the big old fireplace in the crotches of forked sticks with a powder-horn and shot-pouch beside it. In those days the danger was so great and the colonies so small that, in case of an alarm, every man, woman and child devoted his or her energies to resisting the attack. This was a matter of instinct and of necessity, as well as of law, and, there being no other protection, there was good reason why this military organization should remain near home; for these people, having chosen a captain and other officers, constituted what was then called a militia company. As the country became thickly settled and the danger from the Indians ceased to exist and means of transportation from neighborhood to neighborhood increased, and as people ceased to live by hunting and the use of the rifle was forgotten, these organizations passed naturally into decay. This militia may well be called the Pioneer Militia, being organized mainly for resistance to the Indians. It resembled in many particulars the militia organized by King Alfred the Great to resist the incursions of the Danish pirates. These men, who went into the wilderness and endured such risks were indeed heroes, and laid the foundations of our free institutions. Descendants of these men are now organizing societies for the purpose of preserving the history of their deeds and honoring their memories, and are wearing miniature spinning wheels and distaffs, instruments the usefulness of which, like that of the pioneer militia, has passed away, and which, like it, are honored only for the good they have done. To their style of fighting they were well adapted and were superior to the well-trained British regulars, as was made manifest at Braddock's defeat and in the defense of many a pioneer village.

Their rifles were unerring, though their tactics were primitive.

Peace to their ashes and honor to their names.

The country later became populous beyond all expectation, and a very small part of the able-bodied men, if properly drilled, would then afford a large military power. The hunting rifle and the knowledge of its use passed away and the military rifle became effective at so long a range, a mile or two, that the use of it except on specially selected and prepared ranges was dangerous to the citizen. The tactics became more complicated and it required a great deal more special training to make a soldier passably effective. Midnight and stealthy attacks on settlements by Indians ceased. Telegraphic lines and railroads became so effective that troops could be taken on short notice to points where needed and it ceased to be necessary to have them stationed everywhere. Such lines of communication also made it possible to mass a very large military force at any required point by concentrating the trained militia from many localities.

The second class of organizations which come under the constitutional head of militia was the result of abortive attempts under these circumstances to continue the pioneer militia after their decadence had come upon them and their efficiency, as well as the necessity for them, had passed away. They were a sort of reminiscence of the former organizations. They remind one of the little tails and other physical organs that zoölogists tell us animals now have that are descended from ancestors that, in the long ago, used these degenerating organs more than their successors now do. This second class have sometimes been called "the corn-stalk militia." The laws under which the old pioneer militia were organized remained in force after the usefulness of the organization had passed away and are still in force and are the laws under which the "corn-stalk militia" were organized. To be sure they have passed out of the minds of most people, and are only thought of when dug up as matters of curious, ancient and forgotten lore. The present Revised Statutes of the United States, concerning militia, provide that every male citizen between the age of eighteen and forty five shall, with a few exemptions, be enrolled. (Section 1625.) It is every captain's duty to enroll all such persons, residing or who shall come to reside within the bounds of his company (Sec. 1626), and notify every man of his enrollment (Sec. 1627). Every man so notified is required to provide himself with a good musket or fire-lock with bore sufficient to carry balls of the eighteenth of a pound weight,

two spare flints, a pouch with a box therein to contain not less than 24 cartridges, or a rifle, shot-pouch and powder-horn, 20 balls suited to the bore of his rifle and a quarter of a pound of powder; each officer to be armed with a sword or hanger and a spontoon (Sec. 1628). As the spontoons, fire-locks, muskets, flints and powder-horns were not in the market and many of the militia men had no money to pay for them, if they had been, and none of the militia men knew how to use them, if they had had them, and, furthermore, seeing the uselessness of the organization, and the utter monumental folly of requiring all the male population of a large and prosperous country to do military duty, and desiring to bring it into innocuous desuetude, they armed themselves with canes, sticks and corn-stalks, and were hence called "corn-stalk militia." Is it any wonder that such an organization should become ridiculous in its own eyes and fade out of existence notwithstanding the statutes that were in force imposing fines for non-attendance on musters, or that the musters themselves should degenerate into whisky drinking, speech making and horse racing? Think what a spectacle the United States would present on muster day when 10,000,000 citizens of the United States should turn out and drill with corn-stalks! If they were armed with corn-stalks it would devastate quite a field of corn; if, as the statute requires, with fire-locks and spontoons, what a fine thing it would be to own stock in a spontoon and fire lock factory, or to have a corner on flints! How different from the "corn-stalk militia" is the National Guard as it now exists and as I have described it.

But what are the criticisms brought against this poor "corn-stalk militia," long since dead and gone, and which has not now, and, within the memory of men now living, has not had a friend or defender? These criticisms almost all relate to what occurred at a time when Congress, by a strict party vote \* had declared war and "the minority of Congress had published a vigorous protest, in the form of an address to its constituents, both against the war and the manner in which the declaration of war had been brought about," and saying "that they did not wish in any way to help to give implied validity to so flagrant an abuse of power," and stated that "the moral bond which had united the powerful and independent sovereignties should not have been subjected to such a strain so long as its institutions were not more

\* Patton's History U. S., page 584.

mature."\* The war from the beginning bore the character of a mere party war.† Within four days after the declaration of war, the main cause of the declaration was removed by Great Britain and this gave still further force and encouragement to the opponents of the war.‡ Congress refused to supply Massachusetts with the arms to which she was justly entitled and which were necessary to protect her from invasion, and Massachusetts refused the use of its militia to Congress.§ The Embargo Laws were held to be unconstitutional by the State Courts and convictions for their infringement could not be obtained in the State Courts upon the most plain and indisputable evidence of their violation.¶ The war was so unpopular that even the President of the United States seemed to think it impossible to increase the regular army by volunteer enlistment and recommended a draft§ and the Secretary of War proposed to conscript minors without the consent of their parents or guardians, and had a bill introduced in the Senate to provide for it.¶ Finally matters culminated in the Hartford Convention.

What wonder that the poor militiamen in those days, before the United States Supreme Court had settled the question as to who had authority to command them, should have doubted what their duty was, or should have been uncertain whether they were in the service of the State or of the United States, and should have feared to enter the territory of a foreign nation.¶

States are not independent nations and have no recognition as such by international law, and thus have no right to send, or permit their armed militia to go beyond their state bounds, and state statutes often and rightfully provide they shall not.¶ When, even for pleasure, such militia organizations go to or through other states it is the custom and rightfully so, for them not only to have the permission of their own state authorities, but also of the authorities of the states they pass through or visit. These facts have misled the Lieutenant and others, for they have wrongfully applied these restrictions upon militia in the control of their own States to militia in the service of the United States.

I do not wish to enter my appearance in defense of the "corn-stalk militia." Still to an indifferent spectator it would

\* Vol. I. Von Holst's "Constitutional History," page 235. Patton, 584.

† Von Holst, p. 237.

‡ Patton, 588.

§ Von Holst's p. 253, 254, 257, 258.

¶ Patton, 591.

¶ Dunne vs People, 94 Ill. Sup. Ct. Rep. 139.

seem that Lieutenant Birkhimer is pretty severe when he condemns to everlasting disgrace as a military force the whole militia on account of the one experiment with these men. I have not been able to learn whether these men were in the service of the United States or not; perhaps they were and hardly knew it. I have not discovered whether they had taken an oath to support the Constitution of the United States; perhaps they had. In any event they were meaning well, and we should exercise some charity and be to their faults a little blind.

A soldier's duty is not always as clear to him in the field as it is to a critic years afterwards, studying his conduct in the light of a student's lamp.

To condemn the whole body of the militia forever for one such experiment is almost too severe; especially when we are told in the beginning of the criticism that the National Guard will be included in the name "militia," which the critic prefers and will make use of; thus condemning the whole National Guard for "one experiment" made by the old "corn-stalk militia."

Lieutenant Birkhimer's criticisms are effective, not against the National Guard, not even against the friendless "corn-stalk militia," but against the Governors, State Judiciaries, and even against the minority in Congress itself, or, perhaps, some may even think against the President and majority of Congress for declaring war the way they did, and at the time they did, when so very large a part of the people were so bitterly opposed to it. It seems that in one instance at least, referred to by Lieutenant Birkhimer, that of the militia of Vermont, the militia understood their duty better than their own Governor and continued to do it notwithstanding his orders to the contrary.

We are also referred to a long discussion in Congress, which was conducted "not wholly without exhibitions of temper," in which Langdon Cheves showed Congress that the militia might be used regardless of territorial limits, a speech which stupefied the House by its telling blows and to which no adequate reply could be made. Lieutenant Birkhimer says that, although he had the best of the argument, and could not be answered, he was voted down "without hesitation." He fails to say in what particular he was voted down. Certainly it was not on the point that the militia might be ordered beyond the frontier. In order to settle that question, Mr. Key offered an amendment, adding to the pending motion, the words "at any place within



the United States," thus endeavoring to provide that they should not be sent beyond the border. This amendment and limitation was overwhelmingly voted down and "without hesitation."\*

All of these questions have died, some by the arbitrament of war; but the questions as to whether or not a governor could withhold the militia from the use of the President was conclusively settled sooner by decisions of the Supreme Court † referred to by me in my former article. Lieutenant Birkhimer admits this question is so settled and then goes on to recount many discussions and disputes occurring before the Supreme Court decisions. It seems almost a waste of time to refer to these old disputes as objections to the use of the militia now, when it is admitted by all parties that these questions are forever disposed of by the Supreme Court of the United States and in favor of the national use of the militia.

But let us notice an argument used against Mr. Cheves in this protracted Congressional discussion. When condensed and stripped of its grandiloquence, it is about this:—"The militia are intended for the defense of the country; therefore, they must remain in the country. The country cannot be defended except by going beyond the border; therefore, the militia are unfit for its defense."

Or still more condensed.

The Constitution makes it the duty of the militia to repel invasion. Therefore we conclude they must not leave our soil, though this very conclusion renders them unfit to do this very duty." Think of it!

The Constitution does not say the militia shall not pass the frontier, nor say anything like it, nor say anything that can be reasonably construed to mean they shall not.

Would not a jurist, seeking to construe the Constitution, and would not the ordinary, practical, common mind reason more in this way? "The militia are called out to repel invasion. To repel invasion it is necessary to pass beyond the border. Therefore, the militia when so called out are bound to pass the border."

The ordinary citizen who wished to defend a woman or a child from an assailant would place himself between the ruffian and the person to be protected. How much more would a military or

\* See Annals of Congress, Twelve Congress, Part I. A. D. 1811-1812, page 793.

† *Houston vs. Moore*, 5th Wheaton, U. S. Supreme Court, page 1, and *Martin vs. Mott*, 12th Wheaton U. S. Supreme Court, page 19.

ganization, seeking to defend the women and children and homes of the country from invasion, place itself between the invader and those homes and not behind or among the women and children. There is no possible doubt as to what the National Guard would do under those circumstances, if properly ordered.

Another argument used by the opponents of Mr. Cheves was that service in the militia was compulsory and that citizens should not be compelled against their will to go to a foreign land to carry on the war. But it was proposed shortly after, that men should be drafted and minors conscripted and put in the army for the very purpose of sending them abroad to carry on this same war.\* However much or little such an argument might apply to the old militia, or even the Army, for, in case of a draft, it might have men put into it without their consent, it could have no force whatever as applied to the National Guard, for service in the National Guard is not a compulsory, but a volunteer service, and, should the general government resort to draft for conscription, the men drafted or conscripted would be put in the Army and not in the National Guard. Some of Mr. Cheves' opponents urged, it is said, that "militia are to defend our liberties and rights against domestic insurrection and foreign invasion. They are not instruments of power to gratify ambition by despoiling other people of their territory or self-government." Is it intended by this to say that the *Army* is the "instrument of power to gratify ambition by despoiling other people of their territory"? If not, what is the distinction?

I hardly know why we should be referred twice to Mr. Giles in an argument to show that the militia cannot be ordered beyond our borders. Mr. Giles, in the speech referred to, spoke as follows:

"The first object for which the militia may be called forth, is to execute the laws of the Union. A law declaring war, is a law of the Union; and if the war is to be carried on beyond the limits of the United States, it is still a law to be executed, although beyond the limits of the United States and he could see no reason why the militia could not be called forth to execute it. Indeed, it is one of those laws to the execution of which force is indispensably and properly applicable; and if the laws can have a legitimate influence beyond the limits of the United States, the power of Congress over the militia must be co-extensive with the

\*I. Von Holst's "Constitutional History," p. 257-258.

laws, which are thus required to be executed. He would only observe further, that when this subject was more particularly brought into discussion upon a former occasion, it was said, that even in Great Britain, the militia could not be ordered out of Great Britain; no, not even to Ireland. But it should now be recollected, that since that time, the British Parliament, without even a question as to the right, has ordered British militia to Ireland, and Irish militia to Great Britain. Twenty-six regiments are said to be transposed at this time."

"Mr. G. said that considering the peculiar geographical situation of the United States, with colonies at each end of them, belonging to powerful distant nations, with which we may be often brought into collision, it would be unfortunate for the United States if the militia bordering on the lines of separation could not be called forth for any purpose of chastisement, or any other object the Government might have in view, in relation to those colonies or their respective mother countries. If such be the unfortunate organization or interpretation of the Constitution, an amendment for remedying so important a defect ought to be instantly proposed and adopted."\*

As Mr. Giles did not take any steps to have such an amendment adopted, it is fair to presume that the Constitution did not, in his opinion, prevent the service of the militia beyond the border.

My critic refers to the opinion of Senator Robert Toombs, afterwards Secretary of State of the Southern Confederacy and Brigadier General C. S. A., as supporting that of the Governors of New England, although their opinions had, at that time, been overruled by the Supreme Court of the United States. I hardly think the opinion of Senator Toombs in 1855 should be quoted as defining the proper functions of the States as against those of the United States. His ill conceived ideas of the proper function of a State culminated in the Civil War, died at Appomattox, and were buried under the apple tree.

Mr. Pomeroy in his Introduction to Constitutional Law,† says: "It will be observed that in no case can they (the militia) be compelled to serve without the territory of the Union. We do not repel an invasion by attacking the invading nation upon its own soil. Still, there can be no question that the militia may be called out before the invaders have set foot upon our ter-

\* Annals of 12th Congress, 1811-1812. Part 1, p 45.

† Section 473.

ritory. It is a fair construction of language to say that one means of repelling an invasion is to have forces ready to receive the threatening intruders when they shall arrive."

"To repel invasion," are the words used in the Constitution. To repel means "to drive back; to drive from; to chase; to dispel." The Constitution does not say that militia may be called out to stop invaders, but to drive them back. How can they be driven back, if, in the first place, they are not allowed to enter our territory, and the militia is not allowed to go beyond the border to drive them back, or "dispel" them? Neither does the Constitution say to repel an invading army here and there, but the whole invasion is to be repelled. If the Constitution provided that the militia should not go beyond the borders, that would settle the question, they could not go, but the Constitution says no such thing. This conclusion of Mr. Pomeroy's is derived, not from the words or meaning of the Constitution, but from his idea of the proper way to attack an enemy. Mr. Pomeroy's idea of how to conduct a defensive campaign is very different from that of military officers, and his judgment in regard to the method of conducting a campaign in the field is of little value compared with theirs. Applying the usual legal principles of construction, the militia would be expected and it would be their duty to repel the invasion in such place and in such a way as would make their repelling effective. If they are not to attack the enemy, they should be armed with shields and not with guns. When the Constitution prescribed that the militia shall repel invasion, and does not prescribe the way it shall be done, the proper construction would require them to do it in the most effective way, in the way "one skilled in the art" of repelling invasions in the field would do it, so that, if, as is conceded, the way "one skilled in the art" would do it is to follow them beyond our border and subdue them so they will never return, or attack them before they are fully organized and prepared to cross our border, then the Constitution not only permits, but requires them to repel them in this way. Mr. Pomeroy's opinion is, therefore, only valuable so far as it states the legal proposition that it is the duty of the militia to repel invasion, and his opinion as to what is the proper way to do it is only valuable so far as he is sufficiently versed in military matters to know what is the efficient way to accomplish this result. It is not for those military critics who positively and rightly affirm that the repelling cannot be done without passing beyond the

border to say that Mr. Pomeroy is an authority as to the proper way of repelling, and Mr. Pomeroy's opinion on this subject is of no more force than that of any other citizen of equal military knowledge in determining the duties of the militia in this respect.

William Rawle, who was a Philadelphia born lawyer, who practiced there at the time the Constitution was being discussed and adopted, and who was United States District Attorney under Washington, upon this point in his work upon the Constitution of the United States in 1829, said plainly, that the militia in the service of the United States might be ordered beyond the frontier.

Another objection urged against the National Guard is their short term of service. True, the limit of time for which the President may call them out is nine months.\* It is probable that for any service beyond the border they would not be needed for even that length of time; for strategic points might be captured, held and fortified in much less time, and, in all probability, the war ended. If not, nine months would afford ample time in which to organize an army or to detail other members of the National Guard who could afford to be away from home without inconvenience. With the modern improvements in the methods of transportation and in fire-arms, and the general improvement in the art of war, wars between neighboring nations are not likely to last even nine months. The last war between Prussia and Austria was begun June 22, 1866. The battle of Sadowa was fought on July 3d. In this battle the Prussians killed and wounded 40,000 Austrians and took 20,000 prisoners and 174 guns, eleven days from the beginning of the war. On July 26th a truce with Austria was declared, 34 days after the war was begun. On August 23d a definitive treaty of peace was signed, 62 days from the beginning of the war.

The late war between France and Germany was declared on July 19, 1870. The Emperor of France was taken prisoner by the Emperor of Germany September 2, 1870, forty-five days after the declaration of war by France. October 27th Bazaine surrendered 173,000 men, one hundred days after the beginning of the war. On January 28th Paris made arrangements to capitulate, six months and nine days from the time France had declared war.

\* Revised Statutes of the United States, Sec. 1648.

The late war between Japan and China was declared July 27, 1894. On March 10, 1895, the Chinese sued for peace, seven months and thirteen days from the declaration of war, notwithstanding the Japanese, in order to prosecute this war, were compelled to cross a sea of wide extent, and the Chinese Empire had a population about ten times as great as that of Japan. The difference was that the troops of Japan were prepared and thoroughly organized and ready for operations.

The cost is his third objection. It is not troops for a long term of service that we need now so much as troops that are prepared to act the same day war is declared. The only way this can be accomplished in sufficient numbers without too great expense is through some organization such as the National Guard. The National Guard may not be able to conduct its commissary and quartermaster's department quite so economically when called in an emergency as it could if in the service for a period of years, but the time of such expenditure is short and the aggregate excessive expenditure insignificant. Its cost for the twenty or thirty years of intervening peace is about as one to thirty of what it would be if the same number were kept permanently in the service, even including all the cost borne by the nation, the state and by the individual members of the National Guard themselves. If only the cost to the United States is estimated, it is as one to two or three hundred, so that this objection against the use of the National Guard is entirely without weight, and the argument of cost is decidedly the other way.

Objection number 4, the hardship and inequalities resulting from the system, is of no application in the case of the National Guard, the service being voluntary, those who are unwilling to undertake it will not enlist.

The objection which Lieutenant Birkhimer has numbered 2 is worthy of serious consideration: "The want of discipline and familiarity with manœuvres, which rendered it impossible for them to inspire confidence in others or in themselves." Beyond all question there is a steadiness under fire, of troops who have passed through severe battles, that cannot be acquired in any other way, but as wars will probably be so short in the future, that this experience cannot be acquired, and we cannot have preparatory battles and kill off a few thousand men for practice, it is probable that battles in the future will have to be fought without such hardened veterans, and this more than knowledge of tactics



is what inspires confidence. Nevertheless the knowledge of tactics and the habit of obedience acquired by drill and military exercises in time of peace, is of immense value and this requires some considerable time. However it is a constant source of wonder to officers of experience to see how much knowledge of tactics and manœuvres can be acquired by the National Guard in drilling one night each week and by exercises in camp one week in the year.

Especially will the necessary *esprit du corps* and mutual trust and confidence in each other be established if the entire National Guard of a State are brought into camp under the officers who are to command them when called out. The character of the men that compose troops makes all the difference in the world. A body of troops where every individual from the highest general to the humblest private has his entire mental and physical energies directed to acquiring the greatest amount of knowledge in the shortest space of time, and whose moral training has been such that he is ambitious to perform his duty and his whole duty because it is his duty, will learn very much more in a given length of time than a body of troops who feel that time is no object and they have no need to make haste in the matter. As this is the best training that can be given to the mass that will compose the army, and as there will be no time to train soldiers after war is declared, it is probable that the wars of the future, at least as far as the United States is concerned, must be fought with men who enter upon the campaigns with about this kind of training. It is also probable that the armies of European nations will necessarily have to be brought more in harmony with this practice, or the people of Europe will be ground to poverty by their excessive military services and the nations themselves bankrupted by their annual military budgets. They must impress upon their people that their knowledge of manœuvres must be learned at once and have done with it and the soldiers be permitted to return to their homes and engage in productive labor, remaining subject to the instantaneous call of their government to arms. It is not a question of whether or not the troops in such a case would be as good as in the other, but it is a question of what is it possible for the people, and the nations to endure. Lieutenant Birkhimer affirms that the importance of the militia has declined constantly. If he refers to the "Pioneer Militia, yes." If he refers to the "Corn-Stalk Militia," yes, yes. If he refers to the National

Guard, it is submitted whether or not he is not very much in error.

It seems to me that in the discussion of this subject, the militia forces of the several states, whether called the National Guard, or by any other name, one should be imbued with the spirit and genius of our institutions. Surely so long as they remain what they are the Constitution will remain as it is on the subject of the military forces of the Union and of the several states.

At no time of peace will this country ever maintain a large standing army, nor will the people of the United States ever give into the hands of the general government the control of the militia or take that power away from the several states. Hence it is the bounden duty of those in whose hands our military forces, National and State, are placed to endeavor in all ways to build up and encourage by all reasonable means the militia organizations of the several states and to foster on the part of the states, increased organizations, effective armament, intelligent instruction, practice and discipline.

The National Guard and the regular army, must be the reliance of the country in all cases of insurrection and in case of invasion until the Government can organize and discipline an army of volunteers, and the volunteer militiamen will then be largely instrumental in enlisting, enrolling, drilling, and disciplining that army. And intelligent officers like Lieut. Birkhimer, who is possessed of exceptional ability and readiness of resource, should devote their rare talents to the building up of the state soldiery. Nothing is to be gained in any way by pulling it down and heaping obloquy upon it. The dignity of the regular army, of which Lieut. Birkhimer is a brilliant member and exponent, does not demand a belittlement of volunteer militia organizations. Rather let fraternity rule and guide us and let the United States Army and the National Guard go hand in hand in honest endeavors for their mutual betterment and improvement as the guardians and protectors of their country's honor and glory, peace and safety.

## THE INSTRUCTION OF THE SEA-COAST ARTILLERY GUNNER IN FOREIGN SERVICES.

BY FIRST LIEUT. J. M. CALIFF, 3D U. S. ARTILLERY.

IT goes without the saying that the efficiency of Sea-Coast Artillery depends in large measure upon the proper training and instruction of the artillery gunner,—using the term “gunner” to indicate those members of the personnel of an artillery organization,—non-commissioned officers and men,—who are charged with the actual laying of the guns and the supervision of all the minor details of their service.

This instruction naturally falls under two heads, practical and theoretical. The wide scope which it is proposed to give the theoretical portion of this instruction in our service, as indicated by the series of artillery circulars, recently issued and distributed to the artillery, led to the inquiry in the mind of the writer, as to how far the purely theoretical side of artillery art and science was taught the enlisted man in the services of the three great military powers of Europe. In following up this inquiry, application was made to the Military Information Division of the Adjutant General's Office, War Department, for such information as was obtainable concerning the instruction given the artillery gunner in the German, French and English services. From this source was received extracts from the drill and firing regulations of the services mentioned, pertaining to the point in question, together with copy of a letter from Captain Evans, Military Attaché at Berlin, concerning certain points not touched upon in the German regulations.

That which follows is practically made up of extracts from the Firing Regulations of the German Marine Artillery; from the French *Instructions sur la Formation des Pointeurs*, of 1888 and its supplement of 1892, and from the Standing Orders of the English Royal Artillery, 1893, and an official pamphlet on Competitive Prize Firing, 1895.

It is believed that a better idea can be obtained of the scope of this instruction by giving, as near as may be, the words of the drill-book or the regulations, than in any other way.

## THE GERMAN ARTILLERY.

The German Sea-Coast Artillery is under the control of the Minister of Marine. This consists of the Marine Artillery, a body of about 2000 men, under the control of the Admiralty and officered by officers of the navy. It is organized into four divisions or battalions; two of four companies, one of three companies and one of two companies. Each company has 125 men.

In addition to the Marine Artillery proper, there is a regiment of Foot Artillery serving in sea-coast works. There are no drill regulations for sea-coast artillery published by the War Ministry. The regiment of Foot Artillery, serving on the sea-coast, use, in general, the Navy drill regulations, but much is left to the discretion of the battalion and company commanders in the matter of instruction.

The instruction of the Artillery, practical and theoretical, is laid down under the general head of "Firing Regulations for the Marine Artillery."

The exercises usually begin in June of each year, and have for their object the training of:

1. The cannoneers and aspirants for gunnerships.
2. Gunners.
3. Chiefs of Division (commissioned officers).

And are divided into three stages:—

Preliminary Firing. Target Firing. War Firing.

## ALLOWANCE OF AMMUNITION.

The annual allowance of ammunition for each battalion is as follows:

(a) *For Preliminary Practice.*—1500 cartridges for firing with sub calibre tubes; 200 friction primers; 200 percussion primers.

(b) *For firing with service ammunition* and for prizes; for all purposes, with 9, 21, and 28 cm. guns.—90 saluting cartridges; 382 shells; 80 shrapnel. The necessary powder charges, primers, etc., for above.

Of the numbers given above 74 projectiles are set apart for the use of gunners.

In addition, are lighting and signal rockets, torches and signal lights.

## THE TARGETS.

No. 1. A board target 8×4 metres, put up on land or water.

No. 2. A lattice target of the same dimensions, erected on a raft the distance in the clear of the individual lattices equal to half the diameter of the smallest bullet fired against it.

No. 3. A horizontal target made by anchoring target No. 1 in the centre of a rectangle formed of four buoys, the side of which is 50 metres long.

No. 4. A prize target, according to drawings, erected on land or a raft.

#### PRELIMINARY FIRING.

This has for its object, (1) to accustom the cannoneers and gunners to the handling of guns and serving them with shot; (2) to illustrate the differences in firing and effect between blank and war ammunition; (3) to show in what manner the hits vary, due to different horizontal and vertical sightings, and what errors occur through false sighting and the influence of the wind.

The preliminary firing is divided into:

(a) *Aiming Exercises.*—The instruction given in the drill regulations for ships' guns also forms the basis here. It is expected that such a degree of accuracy will be obtained that in three exercises at different times, with the Berdan target, at a distance of 15 metres, the centre of impact of each five shots shall be within a circle whose radius is 15 centimetres.

(b) *Firing with sub-calibre tubes.* The sub-calibre tubes are rifles of various sizes which are adjusted in the bore of the guns so that the axis of the tubes coincide with that of the guns. There is a certain relation between the length of the tube and the gun in which it is used. For small cannon, an infantry rifle is adjusted in the bore. The object of the sub-calibre tube is to give officers and men practice in handling heavy guns and the use of their sights, and at the same time economize ammunition and the strain on the material incident to practice with heavy service charges. The sub-calibre tubes are made by Armstrong of England, according to a French patent, bought by the firm.

This firing takes place at distances of 50, 80 and 100 metres, against a target 5 metres square, moving at a uniform rate, upon which is a bull's eye. The hits have fixed numerical values and a certain aggregate must be made in five consecutive shots.

The record is made up with the same care as in actual practice, showing distance and movement of target, together with data concerning wind, weather and condition of the sea.

(c) *Firing Friction Primers.*—To this instruction must be joined detailed explanations of the various causes of failure to fire, and the precautions to be taken when such failures occur.

(d) *Preliminary Practice for Officers.*—Before firing is commenced the officers must be exercised in measuring and estimating distances and in applying the rules for aiming at moving objects. The estimation of distances is corrected by simultaneous measurements. The time required for finding the range and adjusting the sights must be noted.

The theoretical instruction goes hand in hand with the firing. The more in detail it is given the better the object is obtained. The cannoneers should enter upon the practice with a certain degree of independence. The instruction is given exclusively by officers. It relates to:

1st. The inspection of the gun and its parts, both before and after firing.

2d. Loading, aiming and firing: The instruction is gone through slowly; and the errors due to false sighting and inaccurate aiming illustrated by a series of shots.

3d. The handling of cannon in action.

4th. The handling of the various kinds of service ammunition and their effect and the various circumstances influencing that effect.

The hits are observed from a point on the side of the target. Care must be taken to enable the observers to properly communicate.

#### TARGET FIRING.

The target firing, under the supervision of the company commander, has for its object to accustom the men to rapidity of aiming as well as to independence in firing and promptness in sighting on moving objects, and to exercise the chiefs of division in estimating distances; in controlling fire, and in the application of the principles of the rules of firing on moving objects. The target firing shall afford an opportunity to aspirants for gunnerships to acquire the certificate of gunner, according to existing regulations.

*For Gunners.* This exercise is a repetition, the details of which are arranged by the battalion commander. The firing of aspirants for gunnerships—six to a company,—is regulated by the following conditions:

1st. The 9 cm. gun on siege carriage, at anchored target No. 1,



distance 1000 metres. Each aspirant to fire one saluting cartridge and three service shells.

2d. The 9 cm. gun on coast carriage, at target No. 3; distance 1000 metres. Each aspirant to fire three shrapnels; total for the day, six loaded shells. After the third shot the hits are registered.

3d. The 9 cm. gun on coast carriage, at target No. 1 or 2, towed at the rate of four knots per hour; distance from 800 to 1200 metres. Each aspirant to fire five service shells; using a steamer to tow target.

4th. The 21 cm. gun at anchored target No. 2; distance 1800 to 2000 metres; each aspirant to fire one saluting cartridge and two service shells.

5th. The 21 cm. gun at target No. 3; distance 1500 to 2000 metres, indirect fire, using sliding leaf, sextant and rear sight. Each aspirant to fire two shells.

6th. The 28 cm. gun at target No. 3; moving at the rate of four knots per hour; distance 800 to 1200 metres. Each aspirant to fire three shells.

#### WAR FIRING.

The war firing is under the supervision of the battalion commander. The object is to prepare officers and men of the battalion to engage in battle and to successfully repulse an attack. The forts or batteries coming into action are always cleared for battle. War firing is based on an idea which is explained to officers, gunners and aspirants. The idea must take into account all conditions and requirements under which the forts and batteries will fight, viz. :—

(a) Against hostile squadrons and individual ships.

(b) Against an attempt to land.

For the protection of a blockade.

Shooting at night and in a fog.

The exercises must, as far as possible, give an accurate representation of the circumstances of actual battle and bring officers and men into action as in real war, and must provide against all accidents to the material necessary to the defense.

#### PRIZE FIRING.

Prize firing has for its object the encouragement and rewarding of the best shots in the battalion.

Target No. 4 is anchored at mid-range and to the cannoneers is assigned the task of estimating the distance and making as

good a score as possible. Before the next cannoneer fires the elevation is changed. All communication between cannoneers is prevented. The prizes are distributed according to scores. In case the scores are the same the one made in the shortest time has the preference.

The sum of 200 marks a year is appropriated for the distribution of prizes for good shooting in the Marine Artillery. Two prizes of 9 marks each are given to each company.

The report of the firing and a list of the names of those taking part, with the target sketches, are sent to the Admiralty. The report, concisely worded, must cover the following points:

1. Conduct of individuals.
2. Method of estimating distances and registering shots.
3. Notes on occurrences of interest, relative to guns, carriages, fittings and ammunition.
4. Any occurrences of special interest.
5. Cash expended.

The report of the war firing is accompanied by the battle idea briefly worded. No target sketches are required with the report on shrapnel firing. For prize firing it is sufficient to submit the target sketches.

As appendices to the firing report, in addition to the firing list and target sketches, are the following:

- (1) Copies of the aiming sketches, with report of time in which made;
- (2) abstract of results of firing with sub-calibre tubes;
- (3) report on the practice with signal rockets and pyrotechnics.

#### THE ENGLISH ARTILLERY.

In the personnel of the English Artillery we find the following grades:

Master gunners—1st, 2d, and 3d class.

Gunners—1st, 2d and 3d class.

Non-commissioned officers or specialists.

Master gunners of the 1st and 2d class are warrant officers, with which we have no corresponding grade. Master gunners of the 3d class, so far as their duties go, correspond very nearly with our grade of ordnance sergeants.

All rank and file non-commissioned officers and gunners of horse, field, and mountain batteries and garrison companies are divided into three classes according to their general efficiency as artillerymen.

The 3d class will embrace all young soldiers not dismissed drill and recruits.

Before 3d class men are raised to the 2d class they must pass an examination and prove themselves to be fairly proficient in the following subjects :

*For Garrison Artillery.*

- (a) Drill at the various guns within reach. This to embrace smartness as well as correctness of movement.
- (b) General duties at elementary drill in moving ordnance.
- (c) Preparation of guns for action.
- (d) General knowledge of stores in charge and their use.
- (e) Use of tangent scale, sights, and deflection leaf.
- (f) Fair accuracy in laying and acquaintance with rules for deflection.
- (g) Knowledge of various kinds of projectiles and their use.
- (h) Boring and fixing fuses.
- (i) Heading and unheading powder barrels.
- (j) Knotting, reeving and unreeving tackles.

To reach the 1st class, a man must not only know the subjects above mentioned for 2d class, but they must have a more extended and fuller acquaintance with them ; their laying must be accurate and reliable, and, in addition, they must be well acquainted with the drills, as well as with the fittings, mountings, and preparation for action of the various kinds of guns in the sub-district to which they are attached.

Rank and file non-commissioned officers must be capable of instructing in the above, and in the use and care of any hydro-pneumatic mountings, air-pumps, and jacks that may be at the station.

Sergeants and staff-sergeants, in addition to the above, must be qualified to take charge when mounting, dismounting, and moving siege and heavy ordnance, and in the care of material.

The examination of gunners of the 1st class will embrace the following :

- (a) Material, appliances, machines, and transporting carriages —(as laid down in the Garrison Drill Book, but not to be examined in the drills).
- (b) Magazine duties. This includes (1) nomenclature of magazines ; (2) filling, securing and marking shells ; (3) fixing gas-checks ; (4) filling and making up cartridges ; (5) issue of filled

cartridges and (6) stacking of cartridge-cylinders and storage of shell; trimming of lamps, and system of cartridge and shell lifts, under local regulations.

To qualify for this class, a gunner must pass as well qualified in one of the above subjects, and have a general knowledge of the other. Non-commissioned officers to qualify for 1st class must pass in the two subjects laid down for 1st class gunner and be able to instruct in them.

*Non-Commissioned Officers or Gunners.—Specialists.*

To each Garrison Artillery district at home and abroad is allotted an establishment of specially trained non-commissioned officers and gunners who act as layers, position and depression range-finders, machinery gunners and smiths and siege-train specialists.

These men (with the exception of the layers, who form part of the company establishments) are under the immediate orders of the Artillery Staff Officer of the district, who, under the instruction of the commanding officer, will allot them to the several armed works and positions in proportion to the requirements of the armament. They form a permanent body on the staff of the district.

The term "specialist" includes only the non commissioned officers and gunners who are classified as

Position finders.

Depression range finders.

Machinery gunners,

Siege-train specialists.

Layers.

No non-commissioned officer or gunner will be appointed a specialist unless he has qualified by passing the examination in:—

(a) Use, care, and preservation of position-finding, range-finding, and observing instruments.

(b) Care and use of electrical apparatus, such as telephones, firing keys, batteries, bells, incandescent lights, electric dials, etc.

(c) Gun laying (qualified under regulation test) and dial reading.

(d) Qualification as coxswain of boats, with a knowledge of tides, channels and landing places.

(e) Such knowledge of smithing and machinery as to be a handy man for artificers. Men to hold a machinery gunner's certificate from the Artillery College.

In these examinations no definite proportion of marks for each subject, or number of credits in order to qualify, can be laid down, except in cases of gun-laying, the examination for which will be carried out according to the regulations in force from time to time. It will be the duty of the commanding officers, or of the Board, as the case may be, to see that the candidate is well qualified in each subject.

In case of a 1st class gunner a certificate is required from his immediate commanding officer as to his efficiency in drills, and in either mechanical manœuvres or magazine duties, as before set forth. This certificate must state the drills known and in which one of the two above subjects qualified: it should be subject to confirmation on inspection by the lieutenant colonel.

Rank and file non-commissioned officers 1st class, and sergeants and staff sergeants, 1st class, will be examined by a Board of Officers or be in possession of a Short Course "very good," or Long Course "very good" certificate, respectively.

To qualify as specialists, all grades, except depression range finders, for whom there is a special examination, must be examined and passed as "well qualified" by a Board of Officers.

A book will be kept in every battery and company, showing the classification and date when men are raised from a lower to a higher class. It is to be under the immediate supervision of the officer commanding the battery or company. This book will show by what authority a man is so raised.

1st class men should receive instruction by lecture or otherwise, once a month, from the major or captain. 2d class men once a week from their section officer.

Only those appointed to positions of specialist within the establishment, laid down from time to time, are eligible for the additional pay under the pay warrant. "Layers" receive 3d per day extra pay.

Sergeants of service companies (except siege train) are ineligible for appointment as gun-layers.

In addition to the specialists, non-commissioned officers, and gunners are allowed for various district duties which require no special training. They are to be considered eligible for appointment as specialists as vacancies occur, provided they pass the qualifying examination.

Non-commissioned officers and gunners holding appointments.

as specialists will be reëxamined from time to time as may be considered necessary, to test their efficiency.

#### THE SCHOOL OF GUNNERY.

The school of gunnery is established for the purpose of affording instruction in gunnery and artillery exercises to officers, non-commissioned officers, and gunners of the Royal Artillery.

It consists of two branches, of which the one at Shoeburyness provides for the instruction of the horse, field, mountain and garrison artillery, while that at Woolwich is, in addition, intended to train the militia and volunteer artillery.

There is also a school for the instruction of the Royal Artillery in range finding; this is stationed at Aldershot. In association though not in connection with the School of Gunnery, is an experimental depot which has its school at Shoeburyness.

#### CLASSES AT THE SCHOOL OF RANGE FINDING AT ALDERSHOT.

The system of drill and instruction in Field range-finding throughout the regiment will be in strict accordance with that authorized at the School of Range Finding at Aldershot.

There will be occasional classes for officers and non-commissioned officers.

Non-commissioned officers selected for the classes at Aldershot must be under the rank of sergeant, and be certified by their respective commanding officers to be good riders. They should, if possible, have gone through a preparatory course of instruction, as hereafter detailed, and be in possession of at least a third class certificate. Preference should be given to any one who has learned signalling.

The eyesight of officers and men should be tested before they are selected for the course, and a certificate furnished that they are not short-sighted.

The course for non-commissioned officers will last about six weeks. An examination will be made at the end of the course and certificates awarded to those who pass, according to the credits assigned by the instructor in range finding. This is divided into two parts—preliminary and final. The preliminary embraces range-finding without calculation; range finding where calculations are necessary; general knowledge of the subject and capacity for teaching it, and examination of the instrument. Failure to qualify in the preliminary examination to exclude from the final. The



final examination to consist of four ranges taken at service objects. Marks to be awarded as in the preliminary.

## INSTRUCTION IN GUN LAYING.

*Manual for Non-Commissioned Officers, R. A.*

Before proceeding to instruct in laying, everything connected with the sights and scales, also certain terms, such as axis of the gun, trunnions, line of fire, line of sight, trajectory, range, elevation, depression, drift, velocity, etc., will be explained.

The instruction might be divided into five stages, thus:—

1st stage. Instructional target at close distance; explanation of the ordinary terms, rules, etc.

2d stage. Laying at target at short, medium, and long ranges, under varying conditions of light, atmosphere, background, etc.

3d stage. Laying at natural objects well defined at short ranges, and continued at less well defined objects, puffs of smoke etc., at long ranges.

4th stage. Laying at moving objects.

5th stage. Indirect laying.

Points to be awarded for accuracy and celerity combined and for *viva voce* examination. A man to qualify in 1 and 2 before going to 3, 4, and 5 stages. Those who show special aptitude should be trained until they are perfect.

## LIST OF COURSES OF INSTRUCTION—NON-COMMISSIONED OFFICERS AND MEN.

NATURE OF COURSE.	Number of N. C. O. and Men	Duration of Course.	Under Whom.
Master Gunners.....	35	9 mos. (May to Jan.).	Director, Art'y. Col.
Machinery Gunners....	17	Until qualified.....	" " "
Long Course Gunnery..	40	12 mos (Jan. to Dec.)	" " "
Short Course Horse and Field.....	30	6 weeks (Oct. to Nov., Nov. to Dec., Jan. to Feb., Feb. to Mch)	Commandant, School of Gunnery
Signalling.....	6	6 weeks (March, June, and Sept.).....	
Range Finding.....	18	6 weeks (as asked for 4 or 5 a year.).....	Inspector of Signaling, Aldershot.
Position Finding.....	5	6 weeks (every 2 mos)	Instructor of range finding, Aldershot.
Siege Train Specialist..	12	6½ mos. (Oct. to Apl.)	Director, Art'y. Col.

# 332 INSTRUCTION OF SEA-COAST ARTILLERY.

## ARTILLERY PRACTICE WITH SEA-COAST BATTERIES.

(From *Competitive Prize Firing and Rewards*, April, 1891.)

7 in. guns and upward to be used.

7 in. guns,	24 rounds.
9 in. "	16 "
10 in. "	10 "

50 rounds to each battery.

Each battery to carry out the competition prize-firing test.

Batteries to compete with one another at each station.

The number of prizes depends on the number of batteries competing. Prizes are 1st, 2d, and 3d class.

One or more umpires to be designated in each district.

### CREDITS.

	Moving Target.	Standard Target.
Fire discipline	100	75
Accuracy of fire	150	175
Possible credits for time	50	50
	<hr/> 300	<hr/> 300
200 credits wins 1st class prize.		
175 " " 2d " "		
150 " " 3d " "		

### TARGETS.

*Moving.* A barrel drifting with the tide, or a towed target. If no towing possible, three targets will be anchored at different ranges. The umpire to name the one to be fired at. Ranges for moving targets, 1000 to 2000 yards.

Competing batteries to man two or more groups, and one or more guns in each group, as strength permits. The practice is divided into two series, 1st, drill; 2d, service practice.

*Drill.* Two rounds with each gun with friction or electric tubes (one round by single guns of groups, and one round by group salvos), time taken. No credits given but time and manner of drill will be taken into account for fire discipline.

### PRIZES.

*Gun-layers' prizes.* There should be at least 20 gun-layers to each battery,—non-commissioned officers and men. The bat-

tery commander selects the six men to compete for the gun-layers' prize.

*Gunnery prizes.* Competed for by six selected non-commissioned officers (under sergeant's rank) and men. They have a written examination, as well as practically at drill, and their knowledge of artillery material at their station. Prizes to the three best per battery.

*Individual prizes to gun-layers.* A badge to be worn for one year carrying with it a money prize of thirty shillings.

*Gunnery prize badges.* One 1st class, one 2d class, and one 3d class; each carrying a money prize of thirty shillings, with privilege of wearing for one year.

The fire discipline credits are determined by

Quality of Individual Drill,	30
Quality of Group Drill,	30
Quality of Battery Drill,	40
	<hr/>
	100

#### THE FRENCH MARINE ARTILLERY.

(From the "Instruction sur la Formation des Pointeurs, dans les Corps de Troupe de Artillerie.")

#### *General Provisions.*

The cadre of the layers of a battery comprises :

Master layers.

Layers.

Equally distributing among the pieces.

The master-layers are taken from the layers, according to the order of classification established each year after the schools of practice.

They are six in number; their cadre is always kept full. They are appointed by the commanding officer of the organization on the nominations transmitted through the regular channels by the captains-commandant.

These appointments are published in regimental orders. Entries of them are made in the descriptive book and in the soldier's book.

The reduction of master-layers is proclaimed by the chief of the corps, according to the same forms used in the case of trumpeters, saddlers, etc.

The number of the layers varies according to the resources of

the personnel. It should, if possible, never be less than six. Consequently, in anticipation of vacancies which may happen, the list of layers, established every year after the schools of practice, should include, if possible, twelve names. No artificer should appear in this list. (This number may be increased to 18.)

The master layers wear on the left sleeve of the jacket or dolman, a bursting shell on scarlet worsted. Those who have obtained in competitive firing, one of the three first prizes, substitute for the shell a gold armament of the same description. The non-commissioned officers and the corporals who have been master layers preserve this insignia.

Every non-commissioned officer and corporal should be able to practice and teach laying, as far as his sight will permit.

#### CLASSIFICATION OF LAYERS.

*General provisions.*—A provisional classification of the cannoneers who have taken the special course of instruction is made by the captain before the schools of artillery practice.

A final classification is made after the school of artillery practice. The master layers are always classed by themselves.

The classification of the layers results from a trial intended to show their material skill, and from a memorandum of the captain summing up their moral qualities.

The special trial bears the name of competition in laying.

#### COMPETITIONS IN LAYING.

Every year a competition in laying is organized in every field and fortress battery, at the termination of the instruction in laying and before the schools of artillery practice. All the cannoneers who have taken part in the course of instruction in laying take part in it. The competition is presided over by the captain assisted by his lieutenants.

In the batteries of marine artillery these comprise :

1. A competition in direct laying, carried on with the pieces of 80 or 90 mm., under the same conditions as prescribed for the field batteries.

2. A competition in sea-coast laying.

The competition in sea-coast laying is executed with one or several pieces, of 19 or 24 centimetres, which are chosen from the drill pieces, or from the pieces with which the works are armed and which are supplied with the special apparatus for the training of sea-coast layers. (This is an aiming telescope.)

Suitable weather is chosen. The target is a moving one. In its course, it remains at a distance from the battery comprised between 10,000 and 2000 metres. It is constituted by a tug or small steamer carrying in a central position a mark, clearly visible from the battery, or else carrying at the bow a sphere painted black, 0.50 metres in diameter, at the end of an inclined boom, so that the sphere shows against the water line.

During the time of operations the target follows the course that has been indicated for it, then puts about and takes the same course in the opposite direction, and so on.

The target is designated by the captain, at the start, for all the competitors at once.

A non-commissioned officer, specially designated, fixes the aiming telescope and regulates the telescope and of the sighting line.

The elevation and deflection, thus determined, remains the same during the whole time of the competition, or until it is judged necessary to proceed to a new regulation.

The order in which the competitors follow each other is determined by lot. These arrangements being made and the target in motion, the sight is removed and disarranged, and the competition begins.

Each competitor gives the elevation and deflection indicated at the start, and executes six rounds of laying. Each round is executed at the command "Point," given by a lieutenant. This officer measures, with a chronometer or seconds watch, the time which elapses between the command "Point" and the instant at which the layer gives the indication "Piece Laid"; he notes this time.

#### REDUCED CALIBRE PRACTICE.

Reduced calibre practice is executed with sea-coast pieces of different calibres in which the small calibre tube has been inserted.

This practice takes place at both fixed and moving targets.

The number of cartridges allowed is ten per man. The firing is divided into two parts of five shots each. One series of five is fired at a fixed target; the other series of five at a moving target at sea. The distance of the moving target may vary from 1000 to 2000 metres. The target takes a known course, so as to subject the layers to the same conditions as to those laid down for tug, target, etc., in the Regulations for Competitions in Firing.

The longitudinal and lateral deviations are noted by observers either on the vessel that tows the target or on some other vessel, or by observers at the battery.

#### PROVISIONAL CLASSIFICATION.

The provisional classification is determined from: (1) from the number of points obtained in the field battery competition; (2) from the number of points obtained by each of them in the sea-coast competition; (3) from the number of points obtained by each of them in the reduced calibre competition, and (4) from a memorandum made by the captain. The figures of the captains memorandum vary from 0 to 20.

#### FINAL CLASSIFICATION.

The memorandum made by the captain before the schools of artillery practice is only provisional. Each captain will finally decide then during the artillery practice as to the real merit of each of his layers and at the end of these exercises, will summarize his estimate of each in a final memorandum which will be substituted for the provisional memorandum, and will serve under similar conditions, to establish the final classification.

The classification of the master-layers is kept separate from the others.

#### COMPETITION IN FIRING.

The artillery practice of the year will be concluded in the regiment of marine artillery, in each portion of the corps, and in each isolated group, by a competition in firing between the different batteries of the organization.

The competition is in two parts. It comprises a competition executed with field pieces, 80 or 90 mm., and a competition executed with sea coast pieces, 19 or 24 cm., or exceptionally, of 27 cm.

The sea-coast competition will be carried out in accordance with the following instructions:

Every captain will designate to take part in the competition one of the master-layers who has not yet won the gold ornament.

The total amount of the prizes to be awarded, at the termination of the competition, is calculated at the rate of 10 francs to each battery taking part in the competition. These prizes are fixed as follows:



*Regiment.—Central portion.*—One first prize of 30 francs. One second prize of 20 francs. As many third prizes as the number of the batteries will permit.

*Secondary portions or groups of less than 5 batteries.*—One first prize of twenty francs. As many second prizes as the number of batteries will permit.

*Detachment of one battery.*—One prize of 10 francs.

*Detachment of less than one battery.*—Nothing.

Besides, each of the three first prizes, considering the central portion of the regiment, or each of the two first prizes, if it concerns a secondary portion or group of not less than five batteries, or the first prize in any other case, gives the right to wear the gold ornament.

The competition will be executed with pieces of 10 or 24 cm., or exceptionally, of 27 cm., of the most recent model employed in the sea coast works. The charges used will be drill charges. They will be weighed. The projectiles will be chosen so as to have all of practically the same weight.

A moving mark (a rectangular target 3 metres by 5) perfectly distinct, and analogous to that employed in the school of practice, and towed at a uniform speed between the limits of 8 and 10 knots, will follow a course determined in advance. To accomplish this, two range marks or two signals on shore, as far as possible from each other, will determine a line visible from the tug, for the whole course. The line of signals prolonged should pass about 1500 metres in front of the battery.

The tug will follow steadily, over the course and returning, the line marked by the two signals, and will consequently tow the target in a right line.

A single piece, if possible, will be used for all the layers. The layers follow each other in the order determined by lot.

A special commission is in charge of the preparation and the observation of the trials. The number of shots is four to each layer.

The target being in action, starting from one of the extremities of the course, the member of the commission who directs the firing commands :

“Elevation—(so much).”

“Deflection—(so much).”

“Point.”

The competitor lays his piece and fires as soon as he is ready,

after having given the warning, "piece laid." The piece is then loaded again without further command. As soon as the piece is loaded the command is repeated, and the firing is thus continued until the fourth shot has been fired.

In each series of four shots, the first command "Point" is given, if possible, so that two of the shots may be fired while the target is moving toward the gun, the other two being fired while the target is moving away from the gun.

The time employed in laying for each round will be taken by the chronometer, from the command "Point" of the director to the warning "Piece laid" of the layer.

The member of the commission in charge of the chronometer will remain the same during the whole of the series.

The errors in direction are observed from the battery; the errors in range are observed from the tug. These deviations are expressed in metres. After the firing is over a plot of the shots is made for each competitor, all the deviations being referred to a single position on the target.

The commission determines for each layer: (1) the mean point of the four shots; (2) the sum of the deviations referred to this mean point. This sum is expressed in decimetres, and divided by four will give the mean deviation for each layer.

The names of the master layers, who may be prize winners, will be published to the regiment, etc., in orders.

From the foregoing it appears that the theoretical instruction of the German non-commissioned officer or gunner is confined to the drill regulations. It is to be regretted that the information is not given more in detail, and that it is not more explicit upon certain points, but it is not difficult to read between the lines and so obtain a fairly clear idea of the whole scheme of instruction.

Whatever else may be wanting, there is one thing about which there can be no misunderstanding,—one idea that is impressed upon the mind above all others, and that is the extreme practical nature of the instruction. From the use of a friction primer to the firing of the loaded shell, the man is never allowed to lose sight for an instant of the fact that the ultimate object of his work, down to its minutest detail, is to prepare him to fight. Everything that he learns has some relation to the actual battle condition.

The theoretical instruction goes hand in hand with the practical; it is given at the same time and exclusively by officers. It

is so interwoven with the practical that it is difficult to separate the one from the other. The four different heads under which it is arranged have reference to (1) the inspection of a gun and its carriage before and after firing, (2) the entire service of the piece, wherein the errors due to false sighting and inaccurate aiming are illustrated by a series of shots, (3) guns in action and the provisions to be made against any possible accident to the material, and (4) the handling of all kinds of service ammunition and the various circumstances that influence its effect.

It will be observed that in the instruction of the German sea-coast artillery it is the officers to whom instruction is given and upon whom devolves the duty of estimating and measuring distances, and the application of the rules for firing on moving objects. It will also be noticed that success in obtaining the certificate of gunner does not depend upon the ability of the applicant to correctly read a vernier, nor to guess, with more or less accuracy, the number of yards to a distant object, but rather, as stated in the regulations, upon his ability to do practical work. We read that the target firing shall afford an opportunity to aspirants for gunnerships to acquire the certificate of gunner. For this purpose each candidate is given 18 service shells, to be fired at fixed and moving targets, with guns of three different calibres, and at ranges varying from 1000 to 2000 metres.

The instruction of the non-commissioned officer and gunner in the French and English sea-coast artillery is, like that of the German, essentially practical. From first to last the aim seems to be to make him thoroughly acquainted with his gun, its ammunition, and all the appliances employed in its service, and above all, to teach him how to secure accuracy of fire. To obtain this latter end, to a liberal allowance of ammunition for target practice under service conditions, we find abundant practice in the French and German services, at least, with sub-calibre projectiles, while to stimulate individual effort prizes are bestowed in the form of badges and money in each of the services.

Without drawing comparisons, invidious or otherwise, between the training of our own gunners and those of foreign services, one may be allowed to call attention to certain points upon which it seems we might well take lessons from our trans-Atlantic neighbors.

It is no doubt desirable that the artillery gunner should have some knowledge of the angle-measuring instruments, but it is to

be feared that were an outsider at almost any artillery station to watch the instruction of a class of gunners through the season given up to indoor work, he would come to the conclusion that the manipulation of an instrument, the ability to correctly read a vernier, and familiarity with the plotting board and its accessories, were about the only things considered of much importance. It is to be doubted if he would ever get the idea that to be able to shoot and shoot to hit was the prime object of all this instruction, and that the other, generally speaking was of very secondary importance to the ordinary gunner. It is hardly to be conceived that in time of war this work of the observation stations and plotting house will be confided to any but a body of highly trained specialists,—either officers, as in the German service, or specially instructed enlisted men as in the English. But whether they wear the strap or the chevron they will be *specialists*. This can well be so, as less than a score of men will be able to do the expert work for a whole harbor.

The practical difficulties are so great, in the way of determining, in time of action, the speed or position of an enemy's ship, even with the most perfect instruments in the hands of trained experts, that it is not possible to believe that anything but the best obtainable service will be accepted in connection with observation and range-finding. Surely, no reliance will be placed upon guess work, and the men at the gun,—non-commissioned officer or private,—will have nothing whatever to do with instruments, tables or calculations. All we can or will ask of them, beyond an efficient service of their gun, is an intelligent use of the data furnished from the central station.

The care of magazines, the proper stowage of and preparation of ammunition for the guns, and all the details connected with the repair of partially disabled guns and carriages are surely matters of grave importance to the artillery gunner, but to which very little time or attention is given.

Were our artillery troops at any time sent into the field, with a siege train, for instance, how many men wearing 1st class gunner's badges could even intelligently superintend a squad of dirt shovellers, properly construct revetments, improvised platforms or cover, or efficiently direct any of the details of actual artillery service away from a permanent battery?

I am strongly of the opinion that purely theoretical instruction should play a very small part in the training of our

enlisted gunner, if it be not wholly eliminated, and that the practical part should be confined to those things alone which will add to his efficiency as a fighting unit. With a constantly shifting personnel, this restriction has become absolutely necessary if we are to maintain our troops in a state of fighting efficiency. Whether, with a long term of service and a more or less permanent organization, it would be advisable to undertake a course of instruction that embraces the use of by no means simple mathematical formulæ, a more than elementary knowledge of physics, chemistry, and electrical science, is a question about which there may be an honest difference of opinion: whether it is advisable to follow such a course with short-term men, very few of whom have had early educational advantages, does not admit of an argument with those who have under their charge the matter of actual instruction, away from, and outside the atmosphere in the service schools. In our desire to widen the scope of our instruction it is well to remember the maxim,—“Worship the perfect but accept the possible.”

In the instruction of our gunners we shall not go far astray if we keep in mind, as the Germans unquestionably have, the idea that all instruction should have in view the actual battle condition; that they should never lose sight of the fact that the aim of this instruction is not to enable them to win a gunner's badge or add to the battery figure-of-merit at the yearly examination, but rather to prepare them not only to fight their guns effectively, but also to enable them to provide, as far as human foresight can, against all the unforeseen accidents and emergencies of a battle.

## ALASKAN NOTES.

BY CAPTAIN S. P. JOCELYN, 21ST U. S. INFANTRY.

THE subject of this paper being an expression in brief of some considerations upon our picturesque northwestern province as a possible field for operations of a military or naval character, the attention is first naturally drawn to note the contrasting changes wrought in the map of the United States by the Alaskan purchase of 1867. It extended the limit of our northern boundary from the 49th to the 71st parallel and gave us territorial expansion westward by sixty degrees of longitude, or one-sixth of the circumference of the globe.

Exclusive of minor indentations and the smaller islands it added over four thousand miles of coast line, which, it may be incidentally remarked, is about equal to all other sea coast line of the United States. It gave us St. Elias, the highest mountain in North America, and it gave us the magnificent river Yukon, navigable in summer for light-draught steamers for fifteen hundred miles. It added six hundred thousand square miles to the public domain (at the nominal cost of two cents per acre), an area equal to the original thirteen States of the Union, and transferred the country's geographical centre north-westward from the Mississippi Valley to Puget Sound.

Alaska comprises the whole of the North American continent, west of longitude 141° west, to Bering Strait; all of the coast islands north of and including Prince of Wales Island in latitude 54.40° north; the entire group of the Aleutians which stretch westward from the end of the Alaskan Peninsula, and a long narrow strip of the mainland between the British Possessions and the Pacific Ocean. It has an extreme length north and south of eleven hundred miles and an extreme breadth of eight hundred miles. The island of Attoo is as far west of San Francisco as San Francisco is west of New York; while the distance from the former city to Fort St. Michael, the most northerly point in America inhabited by the white man, is greater than to the city of Panama.

The popular idea that Alaska is an inhospitable land of per-



petual snow and ice is founded upon a misapprehension, in some degree, of the actual facts. It is true that the more northerly coast and the interior districts generally have a climate of extreme severity, but in the Peninsula and the Aleutian islands and on the southwest coast no such degree of cold as is common in Maine or Dakota is recorded. The warm ocean current flowing northward along the coast of Japan is broken and depleted by the Aleutian chain of islands, a part passing into Bering Sea and through the strait, while the main volume bends easterly and southward along the American coast.

When the mild, humid atmosphere that accompanies this ocean stream meets the frost-laden winds from off the snowy peaks of the Alaskan coast range a precipitation ensues that is elsewhere on the globe equalled only where similar conditions exist. Ninety-five inches of rainfall in a single year at Sitka is shown by the meteorological records, with only seventy days out of the three hundred and sixty-five that it did not either snow or rain or both. The average of many years observations is an annual precipitation of eighty-three inches, or nearly seven feet. Naturally incident to such climatic conditions, forests clothe the valleys and mountain sides of the Alexander Archipelago and the mainland adjacent, and are found at intervals throughout the territory northward to the valley of the Yukon. A little beyond this line timber growth practically ceases, and none is found on the Aleutian islands.

The mean winter temperature of the insular and coast region south of the peninsula is 33° Fahrenheit, warmer than Munich, Vienna or Berlin. It is about the same as that of Washington, eleven hundred miles farther south, and is milder than Philadelphia, Baltimore or New York.

Bancroft, the historian of the Pacific States, in a page descriptive of the physical characteristics of Alaska, well says: "Standing at Mt. St. Elias as the middle of a crescent, we see the shore line stretching out in either direction toward the southeast and the southwest, ending in the former at Dixon Inlet, and in the latter sweeping off and breaking into mountainous islands as it continues its course towards Kamchatka. It is a most exceedingly rough and uncouth country, this part of it, the shore line being broken into fragments, with small and great islands guarding the labyrinth of channels, bays, sounds and inlets that line the main land. Back of these rise abruptly vast and rugged moun-

tains, the two great continental chains coming together here as if in final struggle for the mastery. The coast range along the Pacific shore of Alaska attains an elevation in places of eight or nine thousand feet, lying for the most part under perpetual snow with here and there glistening white peaks fourteen or sixteen thousand feet above the sea. And the ruggedness of this Sitkan or southern seaboard, the thirty miles strip, as it is sometimes called, with the Alexander Archipelago, continues as we pass on to the Alaskan mountains and the Aleutian Archipelago."

"It is in the Alaskan Range that nature assumes the heroic—that the last battle of the mountains appears to have been fought. The din of it has as yet hardly passed away; the great peaks of the range stand there proudly triumphant but still angry; grumbling, smoking and spitting fire they gaze upon their fallen foes of the archipelago, giants like themselves, though now submerged, sunken in the sea, if not indeed hurled thence by their victorious rivals. These great towering volcanic peaks and the quailing islands are superb beyond description, filling the breast of the beholder with awe. And the ground about, though cold enough upon the surface, steams and sweats in sympathy, manifesting its internal warmth in geysers and hot springs, while from the depths of the sea sometimes belches forth fire (if certain navigators may be believed) and the sky blazes with northern lights."

Along this ragged fringe of seaboard are dotted the sites of the several military posts established since American occupancy; Fort Tongass first as we cross Dixon Inlet and approach the southeastern extremity of the thirty miles strip; next Fort Wrangell on the island of same name near the mouth of Stickeen River; then the post of Sitka, picturesquely nestled on Baronoff Island at the head of Sitka Sound 'neath the shadows of towering Edgecombe and Verstova. Further northward and westward was Fort Kenai on the south shore of Cook's Inlet. Although this post was situated in the high latitude of about  $61^{\circ}$  north, the meteorological conditions there gave more sunshine and a brighter and more attractive climate generally than was had by the garrisons to the south of it. The bend of the crescent is now southwesterly and brings us to St. Paul on Kodak Island. Here was the earlier headquarters of Russian authority in Alaska before its removal to Sitka in 1799. The military establishment we placed at this point was the one farthest west and completed the semi-circle of American military positions undertaken with a view to perma-

nency, although in the interests of commerce and with especial reference to the fur seal industry, we maintained detachments temporarily in the Aleutian and Pribylor groups of islands, pending the assumption of supreme control of the seal fisheries by agents of the Treasury Department under special acts of Congress.

About fifteen years ago, but not until after the United States had possessed the territory for more than ten years, Congress reluctantly consented to grant a simple form of civil government for our distant province. It has now a governor appointed by the President, as are the governors of other territories, and courts are provided before which ordinary complaints may be heard. This skeleton representation of the majesty of American law is reinforced by the presence of a vessel of the navy, while the treasury officials on the seal islands and elsewhere are upheld in their special functions by one or more cutters of the Revenue Marine Service assigned to summer cruising in Alaskan waters.

But the brunt, and the credit, if any, of the first hard knocks in this new field of government fell upon the army, as is usual on our new frontiers. The formal transfer of the territory to the United States took place at Sitka on the 18th of October, 1867. Brigadier General Rousseau was the commissioner on behalf of the United States to receive it, and when, acting in corresponding capacity for his government, Captain Pestchourof, with brief declaration, ordered the Russian standard hauled down it fell at the feet of a company of the Ninth Infantry drawn up within the castle grounds of the governor's residence. Gen. Rousseau's reply of acceptance was equally brief, courteous and soldierly, the stars and stripes were run up, both flags were saluted by the troops and by the batteries of the men-of-war in the harbor, and the little garrison stood upon the soil of the United States.

Alaska was at once constituted a military department, with Gen. Jeff. C. Davis in command, and companies of the Second Artillery, then in California, were assigned to the various posts. The regiments that subsequently furnished companies for these distant stations were the 4th Artillery, 21st and 23d Infantry, it thus appearing that five regiments of the army, and no more, have had Alaskan service. The duty was far from being mere holiday work. Largely by labor of the troops, barracks, quarters and storehouses had to be constructed outright or the old Russian buildings repaired and remodeled to make them rain proof and

habitable. Communication between the posts was impossible by land; thus doubly eventful became the monthly visit of the mail steamer with letter-bag and supplies. And there was always the spice of hazard in sailing these imperfectly surveyed northern waters. The army register for 1874 contains this final record of Major John S. Walker, Paymaster, and 1st Lieutenant Henry C. Dodge, 2d Artillery: "Lost at sea on voyage from Sitka, Alaska, by wreck of steamer *George S. Wright*, January 27, 1873." The date given is mere conjecture; the *Wright*, returning from the North, sailed from Cape Kygani in a blinding snow storm on Christmas day, 1873, and was never afterwards seen nor heard from, except that about a year later bits of wreckage, including the steamer's name-board, together with a handful of human bones alleged to be Major Walker's, were found by natives on the shores of Prince of Wales island. Olmstead's company of the Second Artillery, en route from San Francisco for station at Sitka, was wrecked in the Gulf of Georgia, and, although in imminent peril, escaped with loss of baggage only through the good fortune of a calm sea. The incident of the loss of the U. S. Steamer *Saranac* on her northward voyage in Seymour Narrows at the north end of Vancouver's Island is historical, and well illustrates the bold abruptness of the northwest coast. With a hole in her bottom and unmanageable in the seething tidal current, the ship's prow swung to the mainland shore, where a stout hawser was made fast to a tree. As the vessel filled she literally stood on end, until finally the hawser parted and she went down, lost to sight in many fathoms of water.

The temper of the native races of Alaska, as shown by the historical records of one hundred and fifty years, may be said to be no worse, and is probably not better than we find displayed by other aboriginal peoples on the continent. During the seventy years of autocratic control by the Russian American Company, whose governor was often a naval officer and possessed, under the company's royal charter, supreme military and magisterial powers, the subjection of the natives was generally accomplished to a reasonable degree. Occasionally, however, the tables were turned, and, to use a familiar simile, "the tail wagged the dog." On the 18th of June, 1802, the Kalosh in the neighborhood of Sitka, smarting under real or imaginary wrongs, attacked and carried the company's principal fort and depot of supplies, massacring the entire garrison, destroying stockade and buildings and appropri-

ating to their own uses the hoard of furs and European merchandise. The assault was admirably conceived and executed. A land and marine force was utilized, the latter having been silently assembled under cover of darkness, and held concealed among the numerous islands of the harbor. Up to the moment of attack there was nothing unusual to be observed without the fort. But at the time agreed upon the old chief took a commanding position upon a knoll, and, giving the signal to attack, shouted with terrible yells to the villagers and canoes to hasten to the slaughter. The sturdy old governor, Baronoff, was absent from Sitka at the time of the massacre, or there might have been still longer delay in restoring Russian supremacy in that quarter of Alaska. As it was, the Indians strengthened the position and held it for two years; and when subsequently retaken by Baronoff, with deserved punishment of the natives, he had the assistance of four armed vessels. So recently as 1855 the Sitkan Kalosh again attempted to capture the fort, but were repulsed with loss of one hundred warriors, the present castle, which dates from the reoccupation in 1804, proving too strong for them.

Like other ignorant and superstitious Indians, those of Alaska are extremely egotistical and sensitive. An example of this distinguishing trait occurred in 1851, when active search was being prosecuted to learn the fate of Sir John Franklin and his party. Lieut. Barnard, an English naval officer on board the *Enterprise*, then in Alaskan waters, had proceeded to Nulato on the Yukon, some miles inland, to investigate the truth of certain rumors as to the murder of a party of his countrymen, thinking they might be of the Franklin party, and in his blunt English fashion casually announced that he intended to send for the chief of the Koyukons, named Larion, who was then holding festival at his village a few miles distant. Larion was a chief of importance and not accustomed to be sent for. When the Russians desired to see him they respectfully requested the honor of his presence. His ire was thoroughly roused at the imagined insult, a council was called and Larion swore that the salmon should have blood to drink before they went back to the sea. It is presumed they did, for poor Barnard and the unsuspecting Russian traders whose guest he was, were massacred to a man at daybreak the next morning.

The historical incidents touched upon seem to me to demonstrate that we have on our hands in Alaska native races whose

subjection to the methods and usages of civilization may, and probably will, in the years to come furnish our small army a new field for its accustomed labors. During the ten years of military occupancy and since, under control of the Treasury and Naval Departments, we had and are having premonitions of the evil that is merely latent. Early in his command of the territory Gen. Davis had occasion to summarily punish a refractory coast tribe for harboring and refusing to surrender certain of its members guilty of flagrant and unprovoked murder of white citizens. By means of an improvised floating battery the hostile village, built of substantial houses near the water's edge, as is the universal custom, was shelled and effectually destroyed. So recently as 1880, for a similar offense by a neighboring band of the same coast family of natives, Capt. Merriman, of the navy, adopted the same method of warfare, with like beneficial and decisive results.

But the more serious phase of the Alaskan Indian question seems likely to present itself and become coincident with the increase of population that will attend the fuller development of the industries and natural resources of the country. It is not the province of this paper to discuss the bounty of nature in these resources, but the vast timber belts of Alaska, her inexhaustible food fisheries, and the hidden mineral treasures of her mountains are certain, in the ordinary course of material development and progress, to attract to fields of industry so inviting no inconsiderable population. If I am not mistaken the largest stamp mill on the American continent for the reduction of gold-bearing quartz is now in successful operation on Douglas Island, near the town of Juneau. The salmon product of Alaska already begins to rival the pack of the Columbia and Frazer rivers, and if her cod banks and timber are, for the time being, neglected, it is because the nearer lumber regions of Puget Sound and British Columbia are not yet exhausted, and because the cod fisheries of the Atlantic have thus far (though not without much international wrangling) proved equal to the world's demand for consumption.

While it is thus seen that the Indian question is not yet to be considered as eliminated from future military problems in Alaska, it is equally evident, as current events show, that even in that distant region, important international questions may arise. Indeed, the most critical controversy with a foreign state to which the United States has been a party in many years is the claim of



this country to certain privileges and rights in regard to the fur seal catch in Bering Sea

England, more prompt to act, if not earliest to appreciate that Puget Sound is the natural base of naval protection for Alaska, has already a well equipped yard and docks at Esquimalt, and there for some time in each year habitually rendezvous the admiral's flagship and most of the vessels of the Pacific Squadron.

### PAY FOR SERVICES RENDERED.

BY FIRST LIEUT. O. E. WOOD, 5TH U. S. ARTILLERY.

THE Artillery of the United States Army dates from the beginning of the American Revolution, when as part of the continental forces, it became a recognized arm of the military establishment.

In June, 1775, Gridley's regiment of artillery makes its first appearance in the fighting line of the American army at Boston. It was raised by the Colony of Massachusetts, and adopted by the continental congress and was commanded by Colonel Richard Gridley, a half-pay British officer who had rendered distinguished service as an engineer and artillerist. It consisted of ten companies,—each having in its rank and file, 4 sergeants, 4 corporals, 6 gunners, 6 bombardiers, and 32 matrosses. At this time the field artillery was manœuvred by drag ropes manned by matrosses who occupied the grade now corresponding to that of private soldier.

In Knox's regiment raised in December, 1775, we see a similar organization for the company.

Again, in Harrison's regiment raised in November, 1776, and in the regiments of Crane, Lane, and Proctor, reorganized in September, 1778, the same distinction between gunners and matrosses exists.

When under a Resolve of Congress of October 3, 1780, the artillery regiments became a part of the Regular Army of the United States, we find once more the same condition to exist.

Bear well in mind that there was likewise a difference in the pay of those grades,—slight to be sure,—but in the early days of our country's history, the difference of two-sixths of a dollar

meant a great deal more than ten times that amount in these degenerate days.

On October 3, 1787, by a Resolve of Congress, the personnel of an artillery company was changed to that of an infantry company, and consisted of 4 sergeants, 4 corporals, 2 musicians, and 60 privates. In other words the grade of gunner was done away with, and the matrosses were obliged to bear the less euphonious title of privates. Now after a lapse of over one hundred years, the grade of gunner has been recognized in the foot batteries of artillery but without the corresponding solace of an increase in pay.

It is my purpose in this paper to show that for the lack of this increased pay, the artillery has been badly handicapped in its struggle to maintain its proper place in the army of to-day.

The great advance made by the artillery during the past ten years in professional knowledge and acquirements, and in modern guns and appliances, has no equal in the history of the world; nor can the services required of the artillery be in any sense compared with those of the infantry or cavalry, yet the enlisted man in each of the three arms receives exactly the same pay.

Lieutenant Best, of the First Artillery, in a paper entitled "Wanted: A Fitting Artillery Organization,"—published in the November number of the *JOURNAL OF THE MILITARY SERVICE INSTITUTION*, says, with reference to some of the modern sea-coast batteries:—

"The first of the United States gun-lift batteries has been practically completed at Sandy Hook. In its subterranean parts are a powerful steam-engine and a smaller one; the former for storing hydraulic power for raising the guns, and the second for electric lighting purposes. On the engine-room level are the magazines. That the fire of these guns may be effective (every war-shot,—wear of guns, etc., considered,—represents about \$1000) we must know from the work of skilled observers the exact distances to objects fired at. Near the gun-lift battery is the battery of sea-coast mortars, covering some acres. These pieces being in pits some twenty-five feet deep, the objects on which they are laid cannot be seen by their gunners. Here, then, a range-and-position finding service must determine not only the distances of objects, but their exact directions from mortar groups as well.

"Near these two batteries, differing as to service conditions, is a small battery of a type of gun known as the pneumatic.

" Here, again, as in the gun-lift battery, we find the steam-engine as a prominent feature, though for an entirely different purpose.

" There are to be other types of batteries, and torpedoes must have an important supplemental rôle in a harbor defense.

" To handle all these and similar matters connected with harbor defense is sea-coast artillery work. Pieces must have their proper complement of non-commissioned officers, and to a proper magazine service these will be indispensable; without clever ones it is difficult to imagine an efficient range-and position-finding service. Steam engines demand engineers; electric lights and torpedo connections and their adjuncts require men skilled in electrics; torpedoing implies boats and boat service. If efficiency be expected of our sea-coast personnel it must not only be highly trained and intelligent as a whole, *especially* as to its non-commissioned officers, but have grades and specialties unknown to other troops.

" In the service of modern harbor defenses it must certainly appear to any one giving the subject a moment's thought, that the work of a battery of sea-coast artillery is of an entirely different nature from that of a company of infantry. Yet, recent proposed legislation provides an identical form for each and fails to suggest, except for one grade, rates of enlisted pay adequate to command for, or retain in the artillery, an intelligence that its efficient service demands. The smaller our artillery force in peace, the greater the need of its good organization and skill, that it may show, when leavening the large reinforcements on which we must always depend, that it has really been worth its keep.

" The country will never have a fitting artillery force until it can be truly represented, not as armed and serving as infantry, but trained in the handling of the heavy artillery of the sea-coast forts, —*organized and serving as artillery; infantry duties being simply incidental to the sea-coast branch.*"

The amount of knowledge required of the artillery soldier is rather startling to the ordinary recruit when he finds that, in addition to squad drill, manual of arms and infantry manœuvres, he must learn how to handle some ten or twelve different kinds of heavy guns and mortars, no two of which have the same drill; commit to memory the nomenclatures of the guns and their carriages; be able to load, train and fire them accurately; perform all sorts of mechanical manœuvres with all sorts of appliances;

have a thorough knowledge of the use of all angle-measuring instruments; be able to take velocities, pressures and understand all about powders of various kinds; estimate accurately the speed of vessels; learn all the vagaries of the wind; to say nothing of working out all sorts of problems by means of "Rogers' Range Tables," with an occasional dip into some problems in "Ballistics"; but I have neither time nor paper to enumerate all that is to-day required of an artillery soldier. I do not mean to say that we require too much of him, for I believe in progress and am glad that we are all the time advancing in professional knowledge in our branch of the service.

But I cannot too strongly emphasize this fact; the supply of college graduates who are willing to enlist in the artillery is entirely too limited to keep our ranks full under the present system of recruiting and pay.

A few words as to the effect in the artillery of the present system of recruiting. At the four recruiting rendezvous there are eight infantry and two cavalry officers (since October 5, 1895, one artillery officer has been ordered on recruiting service at David's Island). At the twenty-nine recruiting stations there are nineteen infantry and ten cavalry officers. A total of twenty-seven infantry and twelve cavalry officers,—each one of whom knows the needs of his own regiment, and, if I know anything of human nature, is very careful to see that when a detachment of recruits goes to his regiment, it is composed of the very best of the available recruits; what is left is good enough for the artillery. I do not wish to be quoted as reflecting on the character of the recruits that have recently come to the artillery, for under the new regulations we get good men because only good men are enlisted, but I firmly believe that if there were an artillery officer at each one of the four recruiting rendezvous, it would be very much better for the artillery. The recent ordering of an artillery officer to David's Island on recruiting duty is a step in the right direction. Let the good work go on.

Now as to the pay. But first let me present a few startling facts. Since September, 1891,—(the date of the first battery competition for gunners)—there have been discharged with *good character* from the ten foot batteries of the Fifth Artillery,—either by expiration of service, by purchase, or under the three years' act,—448 non-commissioned officers and privates.

Of this number, 107 (or 24 per cent.) have enlisted or reen-

listed in the same or other foot battery; 81 (or nearly 19 per cent.) have enlisted or reenlisted in the mounted batteries or in other branches of the service; and 260 (or more than 58 per cent.) have remained out of service.

During this same period, 169 non-commissioned officers and privates have been transferred with *good character* from foot batteries to mounted batteries or to other branches of the service.

The total result being that of 557 men with good character, the foot batteries were only able to retain 107—about 20 per cent.

Why did this 80 per cent.—all good men—leave the foot batteries? Simply because their services were not recognized.

Do you blame them? These, then, are the results in but one of the five regiments of artillery, and it is believed that similar or perhaps more startling results would be found in the other four regiments. This must be changed if we want to keep our best men.

The gunner has his work laid out for him,—give him a *proper* recognition.

It is well known that in the engineers and ordnance there are two classes of privates,—the pay of the first-class private being four (4) dollars per month greater than that of the second class.

It is proposed that the pay of the gunner shall be four (4) dollars per month in addition to the pay of his grade,—be he sergeant, corporal, or private: *provided* he shall have an aggregate of 90 per cent, as determined by the board of officers at each yearly battery competition for gunners.

The distinction between classes of gunners is a mistake. Every gunner should be a first-class one. We want no others.

The manner in which he shall be paid,—whether on the battery pay-roll, or on a supplemental gunners' roll, is of little or no consideration. Let Congress pass the act and we will do the rest.

## Reprints and Translations.

### REVIEW OF MILITARY TECHNOLOGY FOR THE QUARTER ENDING DEC. 31, 1895.

(From the "*Jahrbücher für Deutsche Arme und Marine*.")

BY MAJOR J. SCHOTT.

Translated by Capt. T. A. BINGHAM, Corps of Engineers, U. S. A.

#### SMALL ARMS.

A PERIOD of rest seems to have set in. Since the report of the adoption of a 5 mm. rifle in Austria has proved to be groundless, the lowest rifle calibre in Europe remains at 6.5 mm. It may, however, be assumed that Austria will continue her experiments with 5 mm. rifles which gave good results in 1894; and that corresponding experiments will be made by other countries. It is also not impossible that this calibre may still prove to be a live question after the powder problem has been solved.

Trials are being made in three countries of proposed changes in the adopted rifles. In Austria there is a so-called 1895 sample which is very light. Two of these are being tried, one made at Steyr and the other at a Hungarian rifle factory. They differ only in unimportant particulars.

A change in the German rifle/88 is being experimentally tried by certain troops. As in the improved Mauser, the magazine is made flush with the under side of the stock so that it is less exposed to dust and dirt, being closed on the under side. By this change the cartridges will be inserted with a loading clip which does not enter the magazine, so that the under side no longer needs to be open. Experiments are also being made with a thrusting bayonet.

There is again talk in France of an improvement to the Lebel rifle. An item thereof has been inserted in the budget. Some say the cartridges are to be improved; others that the improvement consists of a small apparatus by which rapidity, safety and penetration of fire will be increased [see Cologne "*Zeitung*," No. 851]. Not much can be gathered from the reports, but it appears likely that a change in the cartridge is intended although this will not be confined to the former much talked of reduction in weight of the bullet. The method of loading cannot be much changed however owing to the small amount of the sum asked for.

It may certainly be taken for granted that none of the three countries



which have reached the highest stage of development in small calibres will be the first to consider a rearmament seriously.

The following countries have finally adopted the 6.5 mm. calibre; Italy in model, 1891; Roumania in M/93; the Netherlands, Norway and Sweden.

Weight of bullet	ranges from 10 to 10.5 g.
Velocities	" 700 to 740 m.
Weight of rifle	" 3.8 to 4 kg.
Weight of cartridge	" 22 to 23 g.

In the case of Italy, Roumania and the Netherlands the package loading is Mannlicher's system; Sweden has Mauser's loading clip; Norway has the Krag Jørgensen side magazine such as Denmark first adopted, followed later by the United States for its army. The cartridges can be inserted either with or without a holder. Up to 500 m. with this calibre the sights remain the same.

The Spanish Mauser rifle M/93 has a calibre of 7 mm. but its characteristics are about the same as those of the 6.5 mm.

Its weight of bullet	= 11.2 g.	Weight of cartridge	= 24.6 g.
" " " rifle	= 3.9 to 4 kg.	Initial velocity	= 728 m.

Between the first small calibres of 8 mm. and 7.9 mm. adopted by France, Austria and Germany, and the 7 mm. calibre the following have since been adopted:

England, Lee-Metford M/89, Mark II.	7.7 mm.
Belgium, the older Mauser M/89	} 7.65 mm.
Turkey, " " " "	
Russia, M/91	7.62 mm.
Switzerland, M/89	7.5 mm.

Bullet weights range from	13.7 to 14.1 g
Rifle " " "	3.9 to 4.3 kg.
Cartridge " " "	25.8 to 28 g.
Initial velocities	" 600 to 650 m.

Reports have lately been published in various places of a repeating rifle, of 6.5 mm. calibre, M/93, system Mauser-Mannlicher, manufactured by the Austrian rifle factory at Steyr. The breech and locking mechanism are on Mauser's system and quite similar to that of the German rifle 88. The repeating device is Mannlicher's. The sights are graduated from 600 to 2000 m. The barrel has no cover except a wooden hand protector. The charge is 5 cartridges.

Length of rifle without bayonet	= 1.23 m.
Length of rifle with bayonet	= 1.48 m.
Weight without bayonet	= 4.01 kg.
Weight with bayonet	= 4.37 kg.

The barrel has 4 grooves, 0.15 mm. deep. Twist = 30.7 calibres = 20 cm. Bullet weighs 10.3 g. Cartridge weighs from 22.5 to 23 g. Charge of smokeless powder = 2.45 g. Length of bullet = 4.83 calibres. Initial velocity = 740 m. Length of cartridge = 77.5 mm. Cross sectional pressure = 0.31 g. on the square mm.

The dangerous space in front of a target 1 m. high is:

at 400 m.	the entire range	at 900 m.	70 m.
500 m.	305 m.	1000 m.	60 m.
600 m.	185 m.	1500 m.	19 m.
700 m.	110 m.	2000 m.	8.5 m.
800 m.	83 m.		

The corresponding carbine has a length of 0.956 m. and a weight of 3.25 kg.; initial velocity of 675 m. and is sighted from 600 to 1800 m.

In 1894 Austria made experiments with the 5 mm. repeating rifle with favorable results. There was also tried an automatic 6 mm. repeating rifle invented by Major Julius Maudry. In the rifle, on firing, the barrel recoils within a cylinder, slightly to the rear. This recoil opens the breech mechanism which is closed by a spring. Further experiments will be made with a rifle of this kind of 8 mm. calibre.

Experiments were also made with repeating pistols, one invented by the Archduke Charles Salvator and Major Domus; another by Mannlicher. The latter is half automatic. In firing, the movable barrel is carried forward by the bullet while the fixed cartridge case is at the same time thrown out by a simple device. When the barrel is again moved back by means of a spring it engages the top cartridge of the magazine and the pistol can be fired again by cocking and pulling the trigger or by continued pressure on the trigger (as in our Smith & Wesson self-cockers—T. A. B.). The cartridges are in packages of 5 on a loading clip. Reports say that the action of this pistol has, so far, been good.

In Russia, after study by a special commission, an army revolver has been adopted of the same calibre as the rifle, viz., 7.62 mm. Smokeless powder is used. Weight of revolver = 780 g.; powder charge weighs 0.8 g.; weight of cartridge = 12.5g.; Initial velocity = 275 m. The bullet is covered with *Melchior* metal and weighs 7 g. Accuracy and penetration are greater than with most other service revolvers. This is due to the avoidance of loss of gas between barrel and revolving cylinder. This is accomplished by making the cartridge case extend around the bullet and beyond it. The cylinder not only rotates but has a motion in the direction of the barrel which permits the projecting part of the cartridge case to enter the barrel. The cartridge case is then, by the explosion of the powder, on firing, forced against the walls of the barrel and thus the escape of gas is prevented. Burning out of the barrel is also thereby reduced, which is of special importance with the high temperatures of smokeless powder. After firing, the cylinder flies back. This revolver holds 7 cartridges, one more than the majority of revolvers. This device was originally invented by Nagant of Liège, but the commission introduced many alterations. Manufacture will first be made by the Belgian firm (Nagant) but later in Russian factories.

In England, from the beginning, the Lee-Netford rifle has not given satisfaction in its firing results, and lately similar conclusions have been drawn from the facts of its behavior in the Chitral campaign. Experiments on dead bodies gave wounds much more severe than those found on the wounded in that war. The *Revue de l'Etranger* for September, 1895, has a short article on this subject based on extracts from English news-

papers. But it reaches no independent conclusion. To give one incident: At the action of April 4 in the pass of Malakand, a native who had been wounded in 6 places (among others head and back) was able to walk to the (English) ambulance and was recovered in an incredibly short time. As regards the use of this rifle in suppressing riots, the reports call attention to the slight danger from the wounds inflicted. Opponents of the rifle claim that it is doubtful, whether, even in the hands of expert marksmen, it would be capable of repelling a cavalry attack. Similar doubts were also expressed in the United States when the question was discussed of the introduction of a small calibre rifle. The considerations, oftentimes expressed in this periodical, in relation to the effect of the new rifles, based on European results confirm, however, the opposite of the English verdict.

#### CANNON.

*Austria.*—Trials were made in 1894 of a steel bronze 8 cm. mountain howitzer. Exclusive use was made of smokeless cannon powder from Pressburg which was a "flake" powder, 1 mm. on a side, made according to the cannon powder formula M/93.

Direct fire charge was 0.125 kg. Mortar fire charge 0.063 kg. As compared with the service 7 cm. mountain gun, probability of hitting was found to be greater in direct fire and the same in mortar fire. The range was found to be greater with shells by 500 paces; with shrapnel by 2000 paces. Bursting effect of shells was found to be the same as before. Shrapnel effect was from  $1\frac{1}{2}$  to 2 times greater with direct fire and with mortar fire slightly better than formerly. The carriage showed a satisfactory endurance in all its parts.

Trials were also made with the 8 cm. casemate cannon M/94; the steel bronze 10.5 cm. cannon; and the 15 cm. battery howitzer.

Special interest attaches to experiments with a steel-bronze 7.5 cm. quick-fire gun on a field carriage. The arrangement of the rifled part of the gun tube is that of the 8 cm. field cannon M/75 whose calibre is 7.5 cm. The experimental gun tube has the falling block breech mechanism of the Military Committee. Gun tube and breech mechanism weigh together 421 kg. The former projectile and ammunition were first used with the exception that the two lowest rifling rings were replaced by a narrow copper band in order to make it easier to press the projectiles into the metallic cartridge cases.

The carriage used was only a temporary construction with a view to the use of a quick-fire cannon as a movable gun in permanent fortifications. It consisted of an upper and lower carriage. The upper carriage turns sideways around a pivot and, by means of a lug, grips the under carriage in such a manner that the latter not only takes up the recoil but also prevents the tilting up of the upper carriage. Elevation ranges from  $-10^{\circ}$  to  $+140^{\circ}$ , and the upper carriage permits of an independent traverse of  $4^{\circ}$  to either side. The wheels are blocked in action by a locking brake. A ploughshare brake is attached to the carriage trail and in the trail is a spring for taking up part of the recoil. On both sides of the carriage are seats for two members of the gun crew who remain sitting during firing.

The charge was 0.25 kg. of the 2 mm. cannon powder of M/93. Resulting precision of fire was, for slow fire, much better than with the 8 cm. field cannon; while in quick-fire, it was only half so good, though sufficient for the purpose intended.

Initial velocity is almost the same as for the 8 cm. cannon. Trials with shell and shrapnel showed practically that the effectiveness was the same as that of the 8 cm. field gun. The gun tube showed satisfactory length of life and endurance; and in spite of the tolerably serious burning out of metal in the smooth projectile chamber only an unimportant diminution in accuracy was experienced. The gun will be introduced in service as the "8 cm. armored gun tube M/94" and "8 cm. minimum embrasure gun tube M/94."

The greatest recoil when the trail is buried in the ground is 7 cm. The effect of the recoil spring in the trail throws the gun so far forward that, even in quick fire, it remains about on the same spot. These movable quick-fire cannons can give 8 to 10 aimed shots per minute and under special circumstances, as many as 15.

The foregoing shows a preliminary experiment in introducing a quick-fire cannon into the field artillery, with a calibre equal to that of the French Deport cannon. At any rate an earnest spirit of progression could not have remained satisfied with the low velocity of the 8 cm. gun M/75 (shell 423 m.; shrapnel 409 m.); nor with its projectile effect.

Trials were also made of the steel 7.5 cm. quick-fire gun No. 1 in a minimum embrasure carriage, which gun is supposed to have the ballistic qualities of the 9 cm. field gun. The tube was made at the Artillery Armament Factory, of domestic steel. It is 26 calibres long and consists of an inner core pressed into an outer tube, which latter has the wedge aperture. There are 24 rectangular parallel grooves with twist increasing from 45—30 calibres. The steel falling block breech mechanism of the Military Committee is used. Gun tube with breech mechanism weighs 396 kg.

The charge was first ascertained which should give a shrapnel weighing 6.1 kg. a velocity of 440 m. with a gas pressure not above 1500 atmospheres. This was found to be 0.4 kg. of the 5 mm. flake powder (with an addition of 10 g. of ordinary musket powder).

Accuracy in slow fire at all distances was very satisfactory, especially at distances greater than 2000 m. where the advantage of greater cross sectional pressure on long projectiles was apparent. In quick fire, dispersion was greater, yet within limits, so that the effect of quick-fire cannon against actual field targets was not affected. After 1300 shots in quick-fire the tube showed only slight changes in the bore and no reduction in accuracy. The carriage will be put in service as "8 cm. minimum embrasure carriage M/94."

When "universal" cartridges were used, rapidity of fire was 10 to 12 shots per minute, aimed. Under favorable conditions and with a specially trained gun crew as many as 20 shots per minute could be fired.

The brass cartridge cases used were from the Berndorf factory and could be used 12 times without being unsafe.

For purposes of comparison with the above, a steel 7.5 cm. quick-firing

cannon, No. 2, from E. Skoda of Pilsen was used. The interior of the tube varies but little from that of the above described, No. 1. The breech mechanism was a patent of Skoda's. A casemate carriage from the factory was used but was not intended as part of the experiment.

The projectiles were  $3\frac{1}{4}$  calibres long and weighed 6 kg. It was found that a charge of 0.38 kg. of 5 mm. flake powder gave a gas pressure less than 1500 atmospheres with an initial velocity of 452 m.

Accuracy in quick fire was better than with No. 1 in consequence of the more stable carriage. The cast-iron ring shells and steel cartridge shrapnel which were used in the experiments gave an efficiency equal to those used with the 9 cm. field gun. The shrapnel "cartridges" were shattered by the explosion so that there was practically no cylinder left. The breech mechanism worked faultlessly. The cartridge cases, which had thin walls, checked the gas well, though they received many cracks at the open end whereby they were useless for reloading.

Both the foregoing experiments had, of course, the main object of solving the question of a quick-fire field gun although they were also of value for quick-firing guns on a broader basis.

Skoda of Pilsen has constructed a 5.7 cm. quick-fire gun in a movable armored carriage, which has undergone trial. The outer tube is of cast steel and 25 calibres long and weighs, with breech mechanism, 185 kg. The armored carriage consists of a steel cupola in which the gun tube is fastened, and of a lower box-shaped construction of plates which contains the elevating and traversing gear for the cupola. Ammunition is brought up in sheet plate boxes which hold, in all, 128 rounds. Two men are required, for whom two seats are provided on the traversing part of the carriage. Weight without equipment=2690 kg.

For firing, the armored carriage was placed on a firing platform behind an earthen breastheight of 1.5 m. height, and the wheels of the carriage rested on a tie of the field railroad. A charge of 0.215 kg. of smokeless 5 mm. flake powder gave the heavy shell, weighing 2.72 kg. a velocity of 488 m. Gun tube and breech mechanism gave, in general, no trouble. The armored carriage is sufficiently roomy for crew and ammunition. Experiments have not yet been carried so far as to give a decisive conclusion in regard to the service value of the construction which is of a type not yet introduced for adoption in Austria.

*Switzerland.*—Experiments will be continued in 1896 with the 8.4 cm. battery and with cylinders of nickel steel for metal cartridges. Special attention will be given to the practicability of shorter cases.

Twelve cm. cannon and nickel steel 8.4 cm. guns for casemate use will be manufactured.

*Spain.*—Lieut. Col. Ordóñez of the artillery, has designed a new mountain gun which is intended to replace the former guns of the Plasencia system. The former is quick-fire, 57 mm. calibre, shrapnel projectile and metal cartridges with smokeless powder. The carriage can be taken to pieces. Five mules are needed for each gun:

No. 1 for the gun weighing 85 kg.;

" 2 " " first half of the carriage and the hydraulic brake weighing 90 kg.;

- N<sup>o</sup> 3 for the second half of the carriage, 85 kg.;  
 " 4 " wheels and axle 77 kg.;  
 " 5 " 2 ammunition boxes, each of 20 rounds, 107 kg.

Each mule carries about 15 kg. less than with the former gun. After the conclusion of the experiments, 100 guns are to be manufactured at Trubia.

#### NAVAL CANNON.

*France.*—The following facts are from the Budget Estimates for 1895-96 for new artillery material for the French navy.

The installation of 42 cm. guns in ships now building has been abandoned and a smaller calibre is preferred, in order to attain greater rapidity of fire. Average initial velocities can also be increased, with these guns, by 40 to 50 m. One of the new ships ("Requin") will be armed with 34 cm. guns M/93 instead of with 42 cm. The largest calibre afloat will hereafter be 30.5 cm. It is also proposed to reduce the largest from 45 to 40 calibres.

Projectile velocities of the 16.47 cm. gun M/91 are 800 m.;

Projectile velocities of the 16.47 cm. latest model M/93 are greater.

Cannon of M/81 to M/84 have been altered into quick-fire guns. The 13.86 cm. guns M/91, on cradle carriages, have given very satisfactory results.

The artillery authorities are occupied with the production of a new type of quick-fire gun of 47 mm. and 63 mm. calibre, which will have a flatter trajectory than the former and a breech mechanism better suited to rapid and uninterrupted fire.

In the main, the 30.5 cm. gun will be the superior type of the large naval calibre; and the 13.86 cm. the nominal type of the medium naval gun. The 4.7 cm. is regarded as the most suitable for small calibres.

#### CANNON MANUFACTURE.

The official report of the Austrian Central Commission upon the World's Fair at Chicago in 1893, contains, under the heading "Berg und Hüttenwesen," detailed accounts of tube manufacture in general by Erhardt of Düsseldorf. This process can also be used successfully for gun tubes. A mandrel is forced into the red-hot "billet" from which the tube is to be made and the interior hollow is thus produced. The rectangular "bloom" or "billet" is put in a round form of the same cross section as the gun tube desired and the mandrel is then, by hydraulic pressure, forced into the centre, thus pressing the metal outwards which then fills those parts of the form which were empty before (the segments). The cross section of the mandrel is therefore equal to the unfilled areas of the form. This process is done at red heat. The tube is afterwards brought to the required dimensions by drawing. Tubes so made were exhibited in Chicago of 4 m. length. The inventor claims that he has thus produced at one operation from molten steel, tubes with a tenacity of 50 kg. to 90 kg. and a diameter of 20 cm., by using a pressure of 180 tons. Rifle barrels can be made in a moment. This process gives, at once, a smooth inner surface and, which is certainly important for fire-arms, imparts greater density to the metal, especially on the inner wall. Only comparatively low power is required and the cost of plant is small.



In Austria, the Poldi foundry has acquired the process and established the necessary horizontal presses with a pressure of 1000 tons. Hence in future the best steel gun tubes can be made at this foundry out of the excellent Poldi cast steel.

#### SHELLS.

Firing and bursting experiments were made at the Swiss artillery experimental station with 12 cm. cast-iron shells with white powder bursting charges. As these are high explosive shells, they have a universal interest.

In firing at wooden walls at a range of 20 m., the cone angle of distribution on the ground was found to be  $91^\circ$ , that formed by hits in the target walls was  $96^\circ$ . Backward hits were hardly found at all. At a range of 2000 m. the normal horizontal angle of distribution was about  $145^\circ$ . In those cases in which the shells burst behind the target walls no signs of hits were observed on the back sides of the targets; hence no pieces flew from the point of bursting backwards.

The distribution of the hits was for the most part irregular but showed in the main, an angle of distribution divided into three parts; one sheaf to the front and one on each side, right and left. In the spaces between these sheafs only single hits were found.

At a range of 2172 m., on a slope of deep turf, the following measurements of bursting craters were made: Length, 2.7 m.; breadth, 2.6 m.; depth, 1.14 m.

The foregoing results were obtained with a 12 cm. gun. Trials were then made with a 12 cm. fortress mortar at  $60^\circ$  elevation and 2370 m. range, and the following crater measurements obtained:

	Length.	Breadth.	Depth.
In good soil	m. 1.9	1.8	0.8
In stony soil	m. 1.5	1.4	0.6
In partly stony soil	m. 1.9	1.6	0.8

The 12 cm. cannon was fired at a range of 1924 m., against the old breast height of a field work built of stony earth, with a thickness on top of 5 m. 28 shots were fired making a breach in the breast height 5 m. wide,—there were 22 hits.

The 12 cm. cannon was also fired at a range of 2006 m. against the breast height of a battery of position constructed of good firm earth. 56 shots were fired, of which 49 were hits. The breast height was breached down to a thickness of 16 m. and an ammunition magazine in the parapet here was rendered useless; while a bomb proof was injured. Continued fire very quickly destroyed magazine and bombproof.

Smoke effects from bursting shells were very good. None of the 356 shells fired burst in the bore of the gun.

#### POWDER.

Smokeless powder was tried in Austria with the 7 cm. mountain gun M. 95; the 12 cm. and 15 cm. siege gun m. 80; and the 15 cm. mortars M. 80 and M. 78. It was desired to determine the proper charges to give the same velocities as before. It was also necessary to determine, in the case of the 7 cm. mountain cannon, whether the normal cartridges could be re-

tained. As the charges were completely burned, no change in projectile was rendered necessary. Results determined use of powder as follows:

Mountain cannon, 2 mm., flake powder of 1893, 1 mm. thick, 2 mm. side; siege cannon, flake powder, 3 mm. thick, 7 mm. on a side. The mortars, 3 mm. cannon powder M/95 for large charge; 2 mm. flake powder for reduced charge.

#### ARMOR.

*Sweden.*—The Government has ordered plates of "homogeneous" steel from Schneider & Co., Creusot, for the gunboat *Odin* now building. The adoption of nickel or hardened steel has not yet been definitely decided on. According to the "Reichswehr" of September 13, 1895, one of the plates ordered must be submitted to battering. It must receive 3 shots from a 15 cm. gun, with regulation Finspong projectiles weighing 45 kg. and a striking velocity of 564 m. Penetration of the plate by projectile or pieces is not permissible. No cracks must result from the first shot and no pieces must be loosened from the back of the plate by the last two shots.

These trials resulted as follows:

Striking velocity of first shot was 567 m. The point of the projectile penetrated 26.5 cm. into the plate without producing a crack.

At the second shot there was the same velocity and the same results and the projectile rebounded 14 m.

At the third shot the striking velocity was 566 m. The plate held out splendidly, not the slightest crack was perceptible and the projectile rebounded 33 m.

After the plate had been removed from its backing, to which it had been attached by twelve bolts, its rear side showed only unimportant injury—a few small cracks and bulges of 38-40 mm. behind the points of impact. The experiments also showed the good quality of the projectiles which remained quite intact and showed only small bulges.

*Austria.*—Experiments were made in Austria against an armored deck target with 21 cm. bombs. The target was 7.5 cm. thick, placed upright and was fired at, from a range of 50 m., by the 21 cm. siege mortar M/80. Only the steel shells pierced the plate with remaining energy and without being deformed. The new pattern of shell fuse with delayed action device showed need of further development. The normal type of 21 cm. mortar M/80 showed itself sufficient for coast defense when steel "ekrasite" shells are used.

#### BALLOON ATTACK.

*Austria.*—Firing was done with four 9 cm. field guns M/75 using shrapnel with double fuse. After 16 shots the balloon showed considerable reduction in volume. Further firing made a big tear and 27 holes. In this latter firing the balloon was 6800 paces off and 64 shrapnels were fired with fuse set for delayed action. After this last firing the balloon began to sink rapidly. The balloon had 2 through and through hits. The others merely made holes on one side.

## CAVALRY TACTICS.

Compiled by COLONEL H. T. HILDYARD, Commandant Staff College.

(From Von Lobell's Reports, Journal of the Royal United Service Institution.)

THE recognition of the possibility of the successful coöperation of cavalry in battle continues to extend and will gain still further ground through Major Kunz's admirable book, "*Die deutsche Reiterei in den Schlachten und Gefechten des Krieges von 1870-71.*"

Two points seem particularly worthy of attention. It seems that in peace manœuvres the cavalry render their task easier than it would be in war by frequently taking up positions in which they could not remain in war. It is then not difficult to act from a *short* distance at the right moment. The great difficulty in leading cavalry is to move it over a distance of several kilometres so as to bring it into collision with the enemy at the right moment; and it is to be observed that to arrive too soon may lead to the destruction of the regiments concerned. More regard should therefore be taken of the enemy's fire during the long stationary period.

Attacks by one squadron or a few squadrons on whole battalions are not to be too often seen. As a rule, no lasting result is to be anticipated from this, and they would be more usefully employed in scouting.

If masses are in question, it should be considered, apart from the cases in which a sacrifice is necessary, whether the anticipated results are in any way proportionate with the stake. Such consideration will occasionally prevent hasty characters from attacking intact infantry, and lead them to defer the attack until the other arms shall have sufficiently prepared for success. Even the riding down of an infantry brigade will not always compensate the expenditure of a cavalry division.

In the German army all complaints against the arming of the cavalry with the lance have ceased; a certain advantage even has lately been claimed for the superiority of this arm in patrol duty. In France the trials with it are still being continued, and in Russia it has its advocates.

Following the example of Russia, which contemplates the strategical employment almost entirely of its whole cavalry force in front of the army, France is endeavoring to strengthen its force of this arm in the first line, whereas the infantry divisions would be provided instead with reserve cavalry formations.

The German "*Meldereiter*" of the future appears as a new creation, which will be copied in other armies. Austria and Russia have already made a beginning in that direction.

*Germany.*

Time has now been given to test the changes made in the new Cavalry Drill Book, provisionally issued in the spring of 1893 after the squadron training had already been commenced. The general opinion as regards the first part is, that the alterations in foot drill are too sweeping, and that those in mounted drill do not go far enough. The opinions against the second part are more weighty still. In it are to be found formations and

movements which no cavalry commander would employ before the enemy.

It is being asked what useful purpose these can serve, and the only answer that can be given to this question is, that manœuvres and difficult movements and conversions increase the manœuvring powers of the troops. We are of opinion there are other means and means more in accordance with service conditions, to attain this end. It is only necessary to work entirely at the gallop, even in difficult ground, and to require the leader to make his decisions while in movement. A regiment so trained, even if it knows only the simplest formations, is safer before the enemy than if it has gone forwards and backwards through the whole scale of parade movements in its own time.

Next to the new cavalry drill in interest for cavalrymen comes the memoir of General von Pelet-Narbonne, "*Ueber Erziehung und Führung von Kavallerie, sowie Uebungen gemischter Truppen im Gelände.*" Space will only admit of brief references being made to those parts of this valuable work which deal with important questions of the day. In the first place, it is shown that the drill of a cavalry division in the formations indicated in the regulations is the first step in its training. This is necessary under the simple conditions of the drill ground in order to create a proper understanding between the leaders themselves, to arrange the communication of orders on proper lines, and to exercise the division particularly as a united whole in riding against a cavalry opponent. This exercise will not be the less necessary that ground is not often available on which entire divisions can be fully deployed and manœuvred. The division exercised in this manner can then complete its training in varied ground by daily-changing schemes against an actual enemy of all arms.

The demand made by General von Pelet-Narbonne for a general introduction of strategical reconnaissance exercises is new and promising. Two happily-chosen examples of such exercises given are calculated to show the scope of the proposal, and to excite interest in it.

More important than all is the fact that the discussion of the question of the organization of cavalry divisions in peace-time is re-opened. For it is not a new question; but, though frequently raised, it has in former years always been adversely decided. The times are now changed. Our neighbors, without our lead, have not only formed cavalry divisions, but keep them as ready to march as practicable on our frontiers. And further, general opinion has recognized the value of cavalry in future battles, provided it is forthcoming in sufficiently large bodies. Finally, it has been accepted that in the strategical reconnaissance a first victory over the enemy's squadrons will admit of the cavalry carrying out their task, and that the initiative is only possible in the plan of campaign in the steps of a victorious cavalry.

If we are to expect the cavalry to achieve important first successes in front of the army a few days after the order to mobilize, and to see it attack with success in battle, it would seem rash to improvise its divisions from beginning to end at the last moment.

*Russia.*

For the time the point of principal interest in Russia is the employment of masses in battle. The conviction fostered by many manœuvres, and also

by verbal expressions of the effect of large cavalry corps, seems to be general. It is supported by the innate belief of the Russians in the irresistibility of their superior numbers. The formal formation of a cavalry corps of three divisions under the command of the celebrated cavalry general, Bodisko, with its own staff, in the Warsaw military district, speaks in itself for the view held as to the importance of masses.

In the Wilna military district a similar force was brought together temporarily at Orany for a week's exercises. The three divisions together amounted to a strength of 76 squadrons, with 36 guns.

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### INFANTRY TACTICS, 1894.

Compiled by COLONEL H. T. HILDYARD, Commandant Staff College.

(From Von Lobell's Reports, *Journal of the Royal United Service Institution*.)

THE practical outcome of more recent tendencies to modification in the tactics of infantry is to be found in the new editions of the French infantry drill regulations and of the German field service regulations. Both will be discussed more closely in another place. It is sufficient here to observe that the French regulations give effect to the general feeling that has long existed against the exaggerated application of fighting in deep formation, in so far as they are opposed to the system of *petits paquets*, that is, of numerous small supports behind the firing line. This is not in itself of much importance, but it is an indication that here and there the theory of formation in depth is being seriously approached, from the practical standpoint of the effect of fire and what appertains thereto.

There can, indeed, be no doubt that the tactical considerations in the matter of formation in depth, as they are almost exclusively expressed in the regulations for the infantry, belong in the main to the times of the Napoleonic wars, and therefore of the smooth-bore muzzle-loader, when, after the musketry fight had burnt itself out, the final decision was generally effected by the action of the reserves, rather than to the times of the small-bore repeating rifle, where the fire effect of masses, dissolved into swarms of riflemen, induces the decision.

The development of modern methods of fighting will, consequently, again approach in many respects more nearly to the procedure of linear tactics, which depended for success on fire-effect alone; it knew nothing of the offensive action of masses, or, consequently, of fighting in depth, for the formation of two lines, of which the second was often not half the strength of the first, and was also brought forward early into it, cannot be regarded as fighting in deep formations as it is now understood, when on an average four to five successive echelons are provided.

Linear tactics gave way eventually before the skilful combination of fire-effect with the action of deep columns; but only because, in the first place, the skirmisher fire proved superior to the fire of the line; and, in the second place, because the small effect of long-range fire allowed the

reserves to be held in readiness in such close proximity to the firing line that they could be brought into action immediately and relatively unweakened.

This is, however, at the present time prevented by the enormously increased effects of distant and rapid fire, so that in the same manner as, owing to the increased effect of fire, the broad fronts of the fighting lines of the 18th century, representative of fire tactics, were developed from the deep masses of the 16th and 17th centuries; so in the present, again owing to increased effect of fire, it is imperative to avoid as much as possible deep masses (echelons, lines, reserves), in order to utilize their fire power as early and as simultaneously as possible. The formal distinction between the fire tactics of last century and of the next will lie mainly in this, that then the fighting took place in cohesive lines; whereas in the future it will be in loose lines, or swarms of shooters.

Whoever is acquainted with the history of infantry tactics knows also that the transition from the masses of the 16th century to the brigades of Gustavus Adolphus, and these again to the thin firing lines of Frederick the Great, was comparatively slow. He will, therefore, not be astonished if a comparatively long time is occupied in passing from Napoleon's mixed battalions (few shooters and many columns), by the company columns of the present day (many shooters and few columns), before the fighting formation of the future, that is, linear swarms of shooters, is reached.

The points which will, according to the so-called reformers, have to be adopted in the future may be stated broadly as follows:—In the first place, uniformly led and simultaneously active firing lines. But the uniformity in leading and the simultaneousness of action can only be aimed at as the result of a fixed organization of the tactical procedure, as well within the division as in the actual fighting bodies. That is to say, the tactical action of these bodies must be organized on certain principles and not improvised for the occasion. The tactical improvisation which was possible with the comparatively small armies of Frederick the Great's time, and in part also at the time of Napoleon, is with the present large armies and short service dangerous, and therefore to be avoided. The so-called tactical "elbow-room," which at the present time plays so great a part in the infantry fight, should for these reasons be restricted to such a degree as to allow only of the skilful employment of fire, always keeping in view that this fire must be brought to bear so as to produce a uniformly concentrated effect. Everything else must be subordinated to this principle.

It is a mechanical condition of the execution of this principle, that the advance preceding an engagement should be made in formations which will admit, as far as possible, of simultaneous deployment; consequently deep columns with small heads will disappear.

The successive placing of the troops in the actual fighting front will cease as far as practicable, and, therefore, the troops must be deployed before coming within the sphere of the enemy's fire. As in a battle—and on this the entire tactical procedure of the infantry must be based—the area of operations for the several bodies follows of itself, and thus also their direction, so also follows the extent of the fighting front of the ad-



vanced firing line, so that the divisional commander is in a position to superintend and decide how many units are necessary for the occupation of this fighting front from the first with broadly extended lines of advancing skirmishers.

Only when this deployment of the force has been effected in appropriate formations on the initial line, should the advance of the bulk of the infantry be commenced, as far as possible, simultaneously, and with definite local objectives to march on; whereas, the artillery will have previously taken up their position protected by advanced infantry. In certain circumstances the artillery will only commence the forward movement simultaneously with the bulk of the infantry.

By this means certain distances naturally result between the different echelons, and a proportionate reinforcement of the entire firing line. This is of the greatest value, for by means of it is secured the continuous development of a powerful, concentrated fire as a condition for superiority of fire itself, and—what is the main point—the only effective basis is created for the delivery of a united assault with full force.

The hostile objections to this transference of certain principles of linear tactics to the present time are based chiefly on the diversity of ground, on the diversity of local objects of attack, of local resistance, etc. On the other side it may be answered that admitting the justice of these arguments, they can never be dissociated from the tactical principle admitted for thousands of years, that united concentrated force is under all circumstances more effective than dispersed force. This applies equally to the attack and the defense.

Lastly, it must not be overlooked that there is no obstacle, whether in the way of the defense or of the attack, which cannot be more easily and surely surmounted by concentrated united tactical action than by action less concentrated and less united.

Why, then, is this advantage, which remains such in all circumstances, to be voluntarily abandoned or restricted at will to a procedure which, though it may be of tactical benefit here and there, cannot be supported by the general results of tactical experiences and of the events of military history?

In the latter direction three works have appeared during 1894, which, resting on a firm foundation of military history, have for their object to make the events and the analysis of these events speak for them. They are "*Kriegslehren in kriegsgeschichtlichen Lehren der Neuzeit*," 1st and 2d parts, by General von Scherff, and "*Taktik der Zukunft*," 4th edition, by Captain Hoenig. It is to be noticed that although entertaining different opinions in the matter of a formal procedure as applied to the attack of infantry, they are both nearly agreed in their judgment in condemnation of the manner in which the infantry attack of large bodies was generally undertaken and carried out in the war of 1870-71.

It would show a certain onesidedness if a work by the Russian General von Woide, "*Die Ursachen der Siege und Niederlagen im Kriege 1870-71*," were not to be noticed. The adherents of the "uncontrolled tactical procedure" deduce from it a support for their mode of view, for the great and often decisive importance of initiative on the result of the war of 1870-71 is

pointed out and dwelt on. But initiative and independence are military qualities which at all times have been superior to passiveness and indecision; and this has really nothing to do with tactical procedure in itself, nor has it been first evidenced by the war of 1870-71. Daring and self-confidence have always been demanded in a good soldier as the qualifications of a leader; but the greatest commanders and the most experienced soldiers have not forgotten to give a fixed binding form to the fighting formations as well as to the handling of these (the leading), and to facilitate the carrying through of the fight by aiming at making the action as united as possible.

The initiative must extend from above, it must pervade the entire military hierarchy down to the common soldier, in the form of, or spirit of, offensive and daring; but it must be bound, by means of tactical procedure, in as firm a frame as possible, within which personal determination still affords a wide field of action, and will always continue to do so. But the impulse to action in war can naturally only be given by him who knows the object he wishes to attain and the means at his disposal for the purpose; and not by anyone who can only see what is in his immediate vicinity, and not the whole. Greater care then should be taken in the employment of the word "initiative" as a tactical expression. Generally, the meaning it is intended to convey is only an ordinary tactical obligation, it is the self-intelligible endeavor to convert the practical considerations on the battle-field into deeds, according to the immediate situation and the objective, without losing sight of the general situation.

A just estimate of the true tactical value of the initiative may be derived from these limitations. A correspondingly moderate appreciation can only lead to the prevention of exaggerations and illusions, which have undoubtedly made their appearance latterly in this tactical question, and which, if transferred to the battle-field, must lead to serious disabuse if opposed to an enemy who holds strongly against compromising the combined action of his forces by tactical habitudes which might find a place in detachment warfare, but not in a ranged battle.

In connection with what has been said regarding the combined action of a force and the unity of its tactical handling, the objection may be made that everyone is agreed as to their value, and that every intelligent leader endeavors already to adopt the tactical procedure of a division, as it has here been indicated. But this conclusion appears only to be academically true, indeed many will regard it as a fallacious one, and an endeavor will be made to prove the proposition more thoroughly by a reference to a concrete case—for in this seem to lie the decisive points in the shaping of tactical procedure, and in connection with it for the conduct of the fight itself.

A divisional commander, fully convinced of the value of the united, and, as far as possible, of the simultaneous course of conduct in action, gifted with distinguished military qualities, is firmly resolved to employ his division "as a whole" and not broken up. But difficulties will arise in putting his resolve into execution, which it is not in his power to overcome, because they have their origin in the general tactical appreciation, and consequently have found expression in the regulations.

Of these, there is first the prevalent advanced-guard theory, springing from the idea that the advanced guard must gain intelligence, feel the way, and, lastly, cover the deployment of the main body. So long as this theory is conventional, as it is at the present time, its advantages and disadvantages may about counterbalance one another in the case of an engagement, that results from the meeting of opposing forces, both of which are on the march. But the disadvantages outweigh the advantages for the attacked when the enemy is assembled—as will almost always be the case on the defensive—or even when meeting on the march, if the enemy in their distribution shall have departed from the conventional form.

To take the first case, our division comes upon the enemy apparently prepared for defense, and the divisional commander avoiding all hurry, gives the order to the advanced guard to act discreetly and avoid all fighting. In the most favorable case, the advanced-guard commander on this does nothing; that is, he forms his advanced guard up under cover, and if he be a particularly sensible man he will forbid any firing, especially by his artillery, which is at the present time allotted to every advanced guard in the strength of from one to three batteries, in accordance with the conventional idea. But even this discretion will not save him from sensible damage if the enemy should understand his business and fall upon the advanced guard with his united forces before—thanks to the usual distances and march formations—the main body is in a position to act effectively.

But in most cases the advanced guard (judging by the war experiences from 1870 to 1895 and by the peace exercises of all armies) will commence an engagement, above all bringing its artillery fire to bear, and often, animated by a false idea of initiative, push forward to gain some local advantage. Thus the fight may be engaged on lines not agreeable to the divisional commander, which render difficult if not impossible the united employment of the division, because the advanced guard must be helped, and this, looking to the conventional march formations, can only be effected by dribbles.

To take the other case of the forces meeting on the march, the supposed careful divisional commander will, with the present distribution on the march, not be able from the outset to quietly deploy the division and employ it united, unless the enemy has also followed the conventional distribution; that is to say, if he has renounced the deep march formations (following General Lewal's system) or has only employed an advanced-guard that is strong in cavalry and quite weak in infantry, which would enable him to undertake a united attack earlier than our division. The latter will by this be at least deprived of the lead as regards attack, and so lose an important chance of success.

Further, the tendency almost universally adopted of fighting in depth, will not only make it more difficult to advance simultaneously a thick, connected firing line, capable of an overpowering fire action; but from the formation of many lines inseparable from this tendency will also increase the difficulty of forming a relatively strong general reserve with which to strike the decisive blow.

If to this be added that the habitudes of detachment warfare, which in

most armies give the measure of the tactical training both of the leaders and the troops, only partially meet the demands of the pitched battle, it cannot be denied that the unity in handling even a proportionately small body, such as a division, can only be maintained under difficulties, looking to the present position of the theory in regard to fighting. But it should and must be the main task of tactical instruction and training to minimize rather than to increase the great friction already existing in the battlefield.

Those who recognize in the points that have been discussed a strengthening of the elements of friction which must be overcome by tactical means, desire a more fixed tactical procedure, not as an object in itself, but rather as a formal means towards attaining more simply and, consequently, more surely the tactical object. The opponents of this view do not deny in principle that one of the main conditions of tactical success is to be found in the united action of mass fire and mass shock; but, on the other hand, they maintain that in the face of modern fire-arms the eventual tactical results to be sought are not to be achieved by the adoption from the outset of a more closely united and, consequently, more uniformly operating tactical procedure. They think to be able to achieve it by means of tactical looseness, which individualizes equally every tactical unit down to the company inclusive, by the help of the most painstaking use of ground and the successive increase of tactical individual result. The formal point of support of this view is the so-called company column tactics and acting on general instructions, for, naturally, tactical looseness lends itself less to a more distinct and frequent employment of orders. One may think as one will regarding "orders" and "instructions," and may be of the opinion that the modern fight does not admit of orders being employed to the same degree as formerly. Up to a certain point this view is quite justified, but it will not be contested that unity in the conduct of a fight is in direct connection with the more or less definite form of the directions.

*Germany.*

During the past year there have been no formal changes in the tactics of the infantry. The German Infantry Drill Book in its second part (the fight) allows of great latitude in the execution of the infantry engagement, and it has lately become evident that this is being taken advantage of in the direction of adopting a stiffer and closer procedure rather than of further developing tactical independence, as is emphasized by the regulations.

This is the case in practice as well in theory. At manoeuvres it is much more usual than formerly to see the purely frontal attack of regiments and brigades. In such a case the initiative of subordinates is more restricted, and will partially even be altogether suspended. But this must also be the case in a pitched battle, for when army corps stand side by side in definitely limited areas the initiative comes naturally and quickly to an end, even in the case of divisional and brigade commanders.

The only new regulations of importance affecting the infantry are a new edition of the "Felddienst-Ordnung" and the "Feldpionier-Vorschrift für die Infanterie."

*France.*

The event of greatest interest tactically was the issue of a new Infantry Drill Book, or rather of the previously existing one (1884) with necessary alterations and additions.

The fighting formation of the infantry, as indicated in it, has been materially simplified, and consists of scouts, a fighting line, and a reserve; the previously existing supports are no longer provided for. The scouts in the proportion of 16 per company in peace and 32 in war, precede the fighting line by about 500 metres in open ground; their mission is to drive back the enemy's advanced troops, reconnoitre his position, and eventually serve as a framework to mark the fighting front.

The companies of the fighting line march at first in small bodies (section or company columns), then in deployed line with open files, and lastly in rank entire. The reserve follows at 500 metres; if it has to reinforce the fighting line, it moves up into the firing line in rank entire or with opened file.

As in the Russian and Austrian armies great value is attributed to volley firing; it is to be employed at about 800 metres against groups, at 1000 metres against lines of the strength of a half section, at 1500 metres at long lines, pelotons, company columns, or artillery, and at 2000 metres against marching columns. Independent fire is only to be used at quite short ranges, and rapid fire only in decisive moments.

## FIELD-ARTILLERY TACTICS.

Compiled by COLONEL H. T. HILDYARD, Commandant Staff College.

(From Von Löbels Reports, *Journal of the Royal United Service Institution.*)

THE important question of the armament of the field artillery in the future has not yet been definitely settled; but views on the subject have become more and more clear. It may now be asserted that the field gun of the future will by no means be a small calibre Q.F. gun with little effect from the single shot. The trials held in various countries have been enveloped in an impenetrable cloud; but the military periodical literature, which affords a pretty true representation of general opinion, has during the year not been favorable to the light field Q.F. gun.

Every State is busied with the re-armament of the field artillery; none likes to make the first move, but all are making preparations for the introduction of an improved pattern in the event of any one of them taking the initiative.

The question whether the best advantage is to be derived from direct or indirect fire, so happily solved by the German Field Artillery Drill Book, has been much discussed in the periodical literature. The German regulations (page 276) lay down the principle, that direct aiming continues to be the greatest desideratum in the selection of the artillery position. This alone

does not in itself warrant the conclusion that direct fire has the advantage over indirect fire, but on page 274 this is distinctly expressed. Indirect fire is restricted to the cases in which the ground or the situation does not admit of direct fire being employed. Notwithstanding this, much has been said on behalf of indirect fire. In this view it is assumed that artillery can shoot as well indirectly as directly, but that with direct fire such losses will be incurred as must within a short period of time result in incapacity for further action. There is a mixture here of the true and the false. It is correct that a well-trained battery, under an able leader, will be able to shoot really well indirectly; but this does not mean that it will shoot equally well, or even better, indirectly than directly. The experiences of the practice ground prove little; for there only a single battery fires indirectly, and even if, exceptionally, a battery formed as part of an artillery division has to fire indirectly, the task is so arranged as not to offer too great difficulties. The difficult point in indirect fire lies essentially in the observation, especially of lateral deviation. So long as one battery only is firing, the difficulty does not really arise, for every burst will be due to projectiles fired by it. But the moment there are several batteries firing together it becomes very hard for the observing battery commander to distinguish the shots that fall with strong lateral deviation from those of other batteries; indeed, it may at times be said to be quite impossible. It is possible only when both the observation and direction of the fire are personally conducted by the battery commander.

In our opinion, the German regulations indicate the only right course. When the conditions do not necessitate the employment of indirect fire, preference should be given unreservedly to direct fire. But as circumstances may, against our will, force us to use indirect fire, we must make ourselves thoroughly familiar with it and practice it in peace-time. The main consideration in a fire position is view; after that only is the endeavor to obtain cover from the enemy's view legitimate. To do so it is not necessary to creep up behind ridges or hedges; with smokeless powder even small bushes, etc., between which the guns are placed, offer an excellent screen.

A third question that has been much discussed is that of the employment of horse artillery in combination with cavalry. This refers especially to the preparation of the attack against cavalry, for as regards the great value of the employment of horse artillery in reconnaissance service there can scarcely be two opinions. Since the appearance of von Hoffbauer's and von Schell's works on the subject, eighteen and fifteen years ago respectively, this question has not been so thoroughly gone into as it has in the past year in the *Journal des Sciences Militaires* and the *Revue Militaire Belge*.

The writer of the paper in the *Journal* starts from the principle that the batteries allotted to the cavalry division must remain united, and can only come into action on one flank of the division. This view will be generally accepted, though in hilly ground that favors firing over one's own troops, a position behind the division might be thought of. The position should be about 500 metres to 700 metres from the line on which the collision of the



cavalry is to be anticipated, and so far to the flank that the division will not be interfered with in its deployment, therefore, about 200 to 250 metres.

The position must be so chosen that it can be taken up as early as possible; if the two lines of advance of the cavalry form an angle, the artillery position should be preferably inside this angle.

By this means the artillery will interfere as little as possible with the movements of its cavalry, it remains in the closest connection with it and is itself sufficiently protected by its situation; from thence it can take the enemy's lines in flank and continue its fire up to the latest moment without being masked.

Everything depends upon the artillery reaching this position at the right time. As they can only occupy it when the divisional commander gives the order to attack, only a few minutes will be available for the purpose. Consequently, the artillery must be already in preparatory formation at a spot as close as possible to the contemplated position; otherwise it cannot be practicable to open fire at the right moment.

If the place accorded to the artillery is 300 to 400 metres before the front, and 200 to 250 metres to one side of it, it will have only about 600 metres to pass over to reach the fire position, and will be able to open fire within about  $2\frac{1}{2}$  minutes from the order being given. The artillery should conform to any movements of the division in preparatory formation, in such a manner as to admit of its participating in the engagement at any moment.

The place thus indicated for the artillery has the advantage that the spheres of action for the artillery and cavalry are separated, so neither arm runs the risk of being impeded by the other, and each one can be utilized as long as possible.

The artillery is there also sufficiently protected, for the entire division is in a position to act at any moment. Patrols to its front and outer flank, as well as a special escort, take sufficient care for its safety. But, even if the position should be somewhat exposed, there must not be any hesitation in taking it up, for there are no other means of ensuring the timely intervention of the artillery in the engagement. The artillery is always the prey of the victor; it best cares therefore for its own safety by contributing to the extent of its powers to the victory of its cavalry.

Looking to the short duration of the cavalry engagement, it cannot be the task of the artillery to cause great losses to the enemy, it must rather endeavor to bring the enemy temporarily into an unfavorable condition, which must be utilized by the cavalry leader. This can be done equally by means of an effective fire, or by drawing away on itself part of the enemy's force. An artillery division can only be endangered by a pretty strong body of cavalry, the withdrawal of which from the attack may be of decisive importance for the result.

The commander of the artillery is always with the divisional commander ready to receive his orders. In cavalry engagements so much of the unforeseen occurs, that the procedure of the artillery can never be definitely laid down beforehand. If this close connection is not maintained, either the artillery will receive their orders too late or not at all. An orderly may deliver them incomplete or incorrect. And further, between the time an

order is given and that at which it is received, the situation may have so changed that it will no longer apply. The distance of 300 to 400 metres in front and 200 to 250 metres to a flank of the first line is sufficient not to impede the freedom of movement of the division, and yet not too great, so that all orders can arrive at the right time. Also the artillery can conform easily to all changes in formation and in direction. The cavalry can, therefore, manoeuvre without regarding the artillery, and can at the same time count upon finding it ready to participate in the engagement at the right place. The distances will naturally vary somewhat according to circumstances; in covered and difficult ground they will generally be rather less; in open, clear ground rather greater.

The separation of the artillery from the main body of the division is only justified in exceptional cases. It is generally not expedient to attach artillery to the advanced guard. This could only be permissible in the case of it being required to push artillery rapidly forward into a position with a special object. But in that case the advanced guard would be really converted into an independent detachment; its own proper task is observation and security in which the artillery cannot participate. Artillery attached to an advanced guard must either fall back with it on the division, in which case the advance secured has to be abandoned again, or it will open fire prematurely and without having a knowledge of the divisional commander's intentions, and so force him perhaps to enter into an engagement under unfavorable conditions.

Exactly similar grounds exist for not sending artillery forward too early into an intended position. In a cavalry engagement the considerations that usually decide the choice of an artillery position are not applicable; here it is only a question of commanding the field of attack by fire. A position then, however excellent from a topographical point of view, is of value only if the engagement comes off in a certain definite manner. But as this depends half upon the enemy, things may result quite differently from what has been anticipated. It is, therefore, generally a mistake to assign a definite position to the artillery too early.

*Germany.*

At the field artillery practice last year, the new shrapnel (c/91), which unites in itself the advantages of shell and shrapnel, was used by the troops for the first time, as was also the high-explosive shell with white smoke. Both projectiles facilitate the shooting, for a change of projectile is not necessary after determining the range.

*France.*

Following the example of Germany, the number of horse artillery batteries has been reduced from three to two. This measure is differently viewed by the French military press. In Germany opinions are also very divided on the subject of the number of batteries it is desirable to have with a cavalry division. Immediately after the war of 1870-71, three batteries were always allotted to cavalry divisions for their exercises. Later on the number sank to two, and finally there have not been wanting those who say that one battery is enough, and more than enough. Now, as is known, a di-

vision of two batteries is allotted for this service. On the other hand, men like Prince Hohenlohe, von Scherff, von Schell, have declared three batteries to be necessary, and also it may be deduced from von Verdy's classical studies in the leading of troops that two batteries are not sufficient for the reconnoitring duties, for in the course of the operations of a cavalry division furnished with two horse artillery batteries a field artillery battery is added to them.

For the actual cavalry fight 12 guns are, in the opinion of the writer, rather too many than too few; for it is only in the rarest cases that they are able to do anything. The real object in attaching horse artillery to cavalry divisions is to act as a support in their reconnaissance service, especially in actions for localities. But as the brigades may very well be sent by different routes, and it can never be known with certainty where hostile artillery may be encountered, the distribution at the rate of one battery per brigade would seem to be the best. That three batteries of six guns, together about 60 vehicles, for a cavalry division of 3600 horses, is an impediment to movement is recognized; but looking to the rapidity of fire and effect of the modern gun, there is the alternative of reducing the number of guns in the battery to four. We should decidedly prefer to have with a cavalry division three batteries of four guns rather than two batteries of six guns, and the ammunition wagons might be still further reduced.

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## OUR MILITARY HORSES.

BY VETERINARY LIEUT.-COL. H. THOMSON, DISTRICT VETERINARY OFFICER,  
Aldershot.

*(From papers of the Aldershot Military Society).*

HAVING been honored with an invitation to offer a subject for the consideration of, and discussion by, the Aldershot Military Society, I thought I could not perhaps do better than give the substance of some remarks I was privileged to address to the Military Society of Ireland, a few years ago, in a lecture entitled "Military Horses and their Management." I propose to give nearly the same lecture, as time and circumstances have since then made but few alterations in the details connected with the management of our army horses. Of course this subject is a very large one, and can hardly be satisfactorily dealt with in a single address, but, all the same, I hope to put before you some of the experience gained in many years, and to make some suggestions which, I trust, may not be altogether valueless.

Many people imagine that a military horse is something quite apart from, and different to, the ordinary animal of civil life, and they are not altogether wrong; for, just as the trained soldier differs from the recruit, so does the trained troop horse differ from the remount. By troop horse I mean the cavalry, artillery, or other equine used in the various branches of the service. When purchased as a remount he is, however, simply an

ordinary horse, having a suitable and satisfactory conformation, sound, and of a height sufficient for the branch of the service for which he is intended. Roughly, the army remounts may be divided into few classes—those for heavy, medium, or light cavalry; horse or field artillery; and transport; and I do not think I need particularize more than to say that the horses used by the Royal Engineers contain specimens of nearly all these classes, and that the Royal Horse Artillery riding horses may, as a rule, be considered fair specimens of the medium cavalry type. Field artillery horses, and the draught horses of the horse artillery occupy a place somewhat midway between the medium cavalry and the transport horse, the conformation being suited to the active galloping draught work of the horse artillery, or the somewhat slower, but still active, work of the field artillery.

Remounts are now obtained, and the arrangements for horsing our army made, by a department officered by experienced combatant and veterinary officers; and I do not think that, on the whole, we have much to complain of as to the way in which this department has met the demands upon it. We frequently hear that our horses are purchased at too early an age, and that, in consequence, they break down in training, or are, by their youth, unfit to undergo the arduous military duties required of them before they are quite mature; but, unless we entirely alter our system, and are prepared to indulge in a much greater outlay, to say nothing of the difficulty in obtaining a sufficient number of suitable horses at—say—five years old, we must make the best of circumstances as they are. If we waited to obtain remounts at the latter age we should in all probability find that, when wanted, they would not be obtainable, having been snapped up by foreign governments which are always on the lookout for just such horses as we ourselves require.

Notwithstanding the fact that our remounts are purchased by a different department, with which I have only an indirect connection, I propose to offer a few remarks upon the principles which should guide us in their selection. I have already mentioned the subject of age, and shall now proceed to consider other points.

#### SELECTION FOR MILITARY PURPOSES.

In the selection of horses for military purposes what should guide us? First of all we should bear in mind what the animal is intended for, which branch of the service, and the special work he will have to perform in that branch; and I do not think I can do better than go over a few of the points to be observed.

The amount of breeding required will depend upon what the horse is required for; and it will be readily understood that, as increase of size or weight is required, so breeding must be sacrificed to a more or less extent, though it is always desirable, even for draught purposes, to have a fair amount of breeding.

Now what do we mean by breeding? And how may we determine the amount of that quality possessed by horses whose pedigrees we are unable to trace?

A horse is said to be more or less well-bred accordingly as he is related, nearly or distantly, to the thoroughbred; and it is by certain points in his appearance that we are able to judge approximately how much or how little breeding he possesses. Irish horses are, as a rule, fairly well bred, and most of our cavalry remounts are obtained in that country. In the well-bred horse you will find the forehead broad and flat; head straight, small, and lean; muzzle small; nostrils large and fine; eyes large and well placed; space between the jaws ample; throat fine; chest deep; hair of mane and tail fine; and legs fine and flat below the knees. Of course we may not see all these points in one horse, but some of them are sure to be found in one possessing a fair amount of breeding.

The coarsely bred horse will be found to have some of the following characteristics, more or less intensified accordingly as he recedes from or approaches good breeding:—Large head; smaller eyes than the well-bred horse; heavy muzzle; nostrils and lips thick; coarse hairs about the jaws; thick throat; short thick neck; large joints; heavy fore-hand; thick heavy legs; and coarse, and frequently curly hair in the mane and tail. These latter horses are more adapted for draught purposes, and here their size and weight are needed, while the heavy fore-hand is adapted for pulling. From horses of this class we select our field artillery, and transport draught-horses. The horse artillery draught horses, although necessarily nearly related to those of the field artillery, require to be better bred, as they have to perform the movements required in the field at a much faster pace; frequently having to gallop long distances, while the field artillery very seldom exceed a trot. Transport horses are not required to go faster than a trot. Artillery wheel-horses require to be powerful, but at the same time compact horses. They need not be so high as the others of the team, but they require to be well made, short-bodied, and short-legged; possessing plenty of bone and substance and with large strong hocks and pasterns, and well-shaped, moderately large feet.

#### HEIGHT.

The next point to be considered is the height of remounts, and here allowance must be made for growth and development. As a general rule young horses intended for army purposes should be about the following heights at purchase as three or four-year-olds: light cavalry, 15 to 15-1 hands; medium cavalry, 15-1 to 15-2; heavy cavalry and Royal Horse Artillery 15-2 to 15-3; Royal Artillery and Army Service Corps 15-2 to 15-3. Horses bought at these heights as young remounts will probably grow another inch, and fill out considerably before they will have arrived at full growth.

#### COLOR.

Color may next be considered. An old saying has it that a good horse can never be of a bad color; but although this may be true in a great measure, the converse is hardly so, for every horse of a good color, is not, therefore, a good horse.

We find, all the same, that certain colored horses have more stamina and disease resisting powers than others. Thus dark-browns, dark-bays,

dark-chestnuts, and roans are better than light mealy bays and light chestnuts. Indifferently bred horses showing a good deal of white are generally objectionable, while blacks and greys vary considerably.

#### CONFORMATION.

We will now turn to the various points necessary to qualify horses for admission into the army. By "points" you will understand that I mean good qualities of physical conformation, and these are roughly as follows:

For cavalry and Royal Horse Artillery purposes a moderately short and broad back, and loin "well ribbed up." That is to say, with only about a hand's breadth of space between the last rib and the prominence of the hip. A moderately broad and deep chest, a well shaped head, and fairly long light neck, a well sloped shoulder, long forearm, shortness from the knee to the fetlock, moderately long and sloping pastern with a strong well shaped foot; quarters broad with well developed thighs, well let down from hip to hock. That is to say, with a good length from the prominence of the hip to the centre of the hock, which latter should be strong and well shaped. Shortness from hocks to fetlocks, with pasterns more upright than in the forelimbs. The tail should be well set on.

These remarks will also apply in a great measure to draught horses, but with these the head and neck may be heavier, shoulder a little more upright, pasterns shorter and more upright. The back also may be a little longer, provided the horse is otherwise satisfactory.

#### DEFECTS TO BE AVOIDED.

We will now consider some of the defects to be avoided.

Avoid a narrow chested horse. A narrow chest indicates deficient lung capacity and a weak constitution. Such horses are also subject to girth galls, and all sorts of defects, such as brushing and so forth. For riding purposes, also avoid horses with very broad chests. Such as these are slow and uncomfortable to ride, although very useful for draught work. A long back and narrow loin, "badly ribbed up"; that is to say, with a large space between the last rib and the prominence of the hip, also indicates a weak constitution, and deficient carrying power. With these are frequently found hocks weak and placed a long way back. Hollow-backed horses should also be avoided for riding; they are not good weight carriers, and the defect increases with age. Avoid an upright or short shoulder. Avoid very long and sloping pasterns, and shallow wide feet; also, avoid small hocks placed close together, or standing far back. They should not either be too far apart. Horses that are split up much behind—I expect most of you understand what is meant by being split up behind—should be avoided as wanting in muscular power and robustness.

#### ACTION.

Having carefully looked over our intended purchase while standing still, we should next examine his movements at a walk and trot. For this purpose the animal should be led with his head as free as safety will permit, in a straight line away from and back to the person inspecting him, and the movements of the fore and hind limbs carefully noted. The walk should



be free and true, the limbs being advanced to the front in regular rhythm, without any winding action, and with a long free stride. Shuffling is objectionable, and the limbs should clear one another well. On the turn any stiffness or stiltiness should be noted and the cause looked for—although this, perhaps, appertains more to the veterinary examination. The action of the fore limbs should be watched while the horse is being led back, and it is also well to have him walked past one. Should he be a good walker he will most probably trot well, although a good trotter is not always a good walker, and good walking is most essential in a military horse. The trot should be free and the movements of the limbs easy. A short niggling trot is most objectionable, and it is not unusual to find horses with this kind of action very unsteady in the ranks. At the walk and at the trot the horse should carry his head well, and be perfectly free in all his movements, the limbs being advanced in perfect regularity, and the feet set down without fear.

What I have said thus far is, I think, sufficient to roughly guide an inspecting officer or one about to purchase horses. The veterinary examination is quite apart from this, and is, of course, very necessary in the selection of horses for the army. Few horses are free from some fault or other, but one bad fault should be sufficient cause for rejection, no matter how good a horse might otherwise be. When in doubt give yourself the benefit and reject.

There are several other little points which I might have mentioned, but I think that, perhaps, I had better now proceed to the next part to be considered.

#### RECEPTION OF REMOUNTS.

We will now take it for granted that remounts have been purchased and are in process of delivery to the corps to which they have been assigned. What preparations should be made for their reception?

Good light airy stables, with sufficient accommodation to allow two stalls per horse, should be selected; the stables being quite distinct, and, where possible, apart from the troop stables, to prevent the possibility of the introduction of infectious disease. Doors and windows should be left quite open, the stables thoroughly cleaned, and, if time permit, lime-washed. As soon as the floors, etc., are quite dry, as much *old* bedding as possible should be collected from the troop stables—where the troop-horses are healthy—in exchange for new, and placed in the stalls to be occupied by the remounts. It will not be possible to obtain all old bedding, as some must be retained for the troop stables to be mixed with their new, but it is advisable to have as much old bedding as possible for remounts, to obviate its being devoured by them, as it soon would be if entirely new. The heel-posts and about three feet of the rear ends of the bails should be wrapped with straw ropes, the wrapping on the heel-posts beginning at about six inches from the floor, and extending to about three feet or more high; all loose ends of straw should be clipped off, and it is a good practice to have the wrappings sprinkled with a weak carbolic solution. This will prevent them being eaten, to a great extent, and helps to keep them sweet. The object of hav-

ing the heel-post wrappings raised from the floor is to allow the broom to be used round the posts, and also to prevent the accumulation of filth in the lower turns of the wrappings. Care should be taken to ensure the issue of a complete grooming kit in readiness for each horse, and, if a large number of remounts are expected—and especially if coming from a distance—a few blankets also. The stables should be allowed to remain wide open until the horses arrive, when, according to the season of the year, and local circumstances, the veterinary officer in charge will give directions for the proper amount of ventilation necessary. As a general rule, when the weather is warm, or during the summer, doors and windows may be left open for a few days. Remounts joining during the summer and autumn usually arrive almost straight from the open fields, and care should, therefore, be taken that they are very gradually accustomed to being confined in stables. The greater the amount of fresh air they have, consistent with absence of direct draught, the less will be the tendency to contract coughs and colds; and, as they become accustomed to stable life, so the ventilation may be gradually arranged to suit the circumstances in which troop horses exist.

Forage should be in readiness. For the first two or three days this should consist simply of bran mashes and hay; a small portion of oats—about one-fourth of a ration—being mixed with the bran as soon as work is commenced, and gradually increased to a full ration with or without bran. This arrangement of the forage will depend a good deal upon circumstances and the individual requirements of the remounts. No hard and fast line can be laid down, but, as a rule, what I have recommended will be found to answer fairly well.

Care should be taken that remounts on first arrival should not be allowed to fill themselves with water. They will probably arrive very thirsty, and, if permitted to do so, will drink largely. One ordinary bucket and a half should be sufficient at first. They can be given more if they require it afterwards, care being taken that they are not watered soon after feeding.

Having now been bedded down, watered, fed, and made comfortable, remounts should be left to themselves as soon as possible, and permitted to lie down undisturbed. A stable sentry will be necessary for each stable of twenty or more horses, and he should be instructed not to interfere unless in the event of horses getting over collar chains or bails, fighting, or other unusual occurrence; but wandering about among them without any cause but curiosity should be forbidden for the first twenty-four hours at least. Remounts are generally unshod behind, and consequently do little damage to one another by kicking. Any horses arriving shod behind should have the shoes taken off as soon as possible to prevent accident.

#### EXERCISE AND WORK OF REMOUNTS.

The Queen's Regulations tells us that "the exercise and treatment of remount horses is to be regulated by their age, strength, and condition at the time of joining. They should, however, be taken into quiet work immediately on joining." These are good rules. No horse is so liable to disease as an idle one, and within forty-eight hours of joining all remounts in good health should commence work. Very lightly, of course—at first sim-

ply handling and exercise—and the increase in the work should be very gradual.

It is, I am afraid, the tendency now-a-days to push on remounts with the object of getting them into the ranks as soon as possible, and I have seen instances of thoughtless, although well-meant, mismanagement of undeveloped, but good remounts, result in their utter collapse and break down, when the exercise of a little thought and patience would have saved the animals to the service. How can it be expected that a three-year old horse should be able to undergo the same amount of training as a four or a five-year-old? And yet I have seen this done frequently, with the result that hocks and tendons break down under the strain; splints, spavins, and other bony enlargements are developed, and the horse rendered practically useless for some time, if not for good. The very greatest care and attention should be given to the training of young horses, and any attempt at pushing on undeveloped, but promising three-year-old remounts sternly discouraged. No horse is thoroughly fit for the work of a cavalry regiment in the present day under five years old, and the training of remounts should be arranged so that they will join the ranks as near that age as possible. The training of four-year-olds will, or should, occupy much less time than that of three-year-old remounts, whose work should be very gradually increased in consideration of their undeveloped physical condition.

I am well aware of the difficulties under which commanding officers labor. They are asked to show as many horses as possible in the ranks, and in their anxiety to do this, and also in the anxiety of the riding establishment of the regiment or corps to satisfy these demands, the training is sometimes what I may term "rushed." Some day we may have a system of training young horses under which regiments may be relieved of the difficulties attending the reception and military education of large numbers of young horses at a time when they are expected to be ready for active service, and I am sure commanding officers would be glad if this could be done. Under a system of this kind horses would join their regiments fit for immediate work, and at an age when they would be less liable to break down under the strain of severe work in the ranks. Moreover, they would last much longer, and we should probably find fewer horses cast at thirteen and fourteen years old as "prematurely worn out," while the present limit of fifteen years of age at which they may be cast as "aged and worn out" might be extended a year or two.

One remedy for the present state of things, which has been suggested, is that we should adopt the fifth or reserve squadron system of some continental armies and adapt it to our own requirements. To my thinking we might easily do worse, but I would limit it to those regiments, batteries, etc., of the first army corps until we see how the system works. In this squadron we might put all the recruits, remounts, old horses, and older men, until the young soldier and young horses were fit for work in the ranks, at the same time keeping the service squadrons at full strength, and free from the disadvantage of having horses unable properly to hold their own, with those more mature, without risk of breaking down, and also having a place where those that fail might recover, being replaced

for the time by those most ready to enter the ranks. I grant that this is a large question, requiring very careful consideration; but, if the country could be persuaded to give such a system a fair trial, I think it would give great satisfaction to many experienced officers.

During the training of remounts the very greatest care is necessary to prevent sore backs, and other casualties. Every little chafe, even when only the hair is rubbed, should be at once brought to notice. If neglected, it may lead to the horse being thrown out of work for some time and leave him with a permanently tender spot which may give much trouble at a time when his services are most required. Every little swelling or tenderness of any part of the limbs; any lameness, no matter how slight; any loss of desire for food—in fact anything unusual, should be at once attended to, and in this way, serious lameness or disease may be prevented. The men having charge of remounts should be instructed accordingly, and the non-commissioned officers should exercise the very greatest care that the veterinary officer is informed of everything unusual that may be observed.

#### TROOP STABLES.

We will now proceed to consider the circumstances under which our troop horses exist in barracks, and will first take the stables in which they are placed. I do not propose to go into detail regarding the construction of stables, but shall consider them as we find them. The subject is much too large and would occupy too much time to be minutely entered into now.

We have a great many varieties of stables, and find that hardly any two stations can be said to have stables of similar construction. Many of them are old and cramped, low-pitched and stuffy; while a few of more modern construction verge upon the other extreme, and are very cold in consequence. The modern troop stable is, notwithstanding, a very good one.

#### FLOORING.

I do not think we have yet arrived at a thoroughly satisfactory flooring for troop stables. The types in use vary considerably, from the old cobblestone pavement to the modern granolithic concrete. We have stone pitchers, stone setts, asphalt pavement, vitrified bricks, and various concrete pavements, but none can be said to satisfy all requirements. The cobblestones collect dirt, and are not easily cleansed, while most of the floorings become very slippery with wear, and broken legs and other injuries are the result. The flooring we require is one with a hard surface, impervious to moisture; one that will not easily wear into holes and will not become slippery with wear and tear.

A flooring material, of which we have seen a good deal in the reconstruction of this camp, is what is known as Candy's brick. This certainly seems to be very fairly satisfactory, for it combines most of the qualities which we wish to obtain in a stable flooring. It is hard, easily repaired, when properly set impervious to moisture, and easily cleaned; but it is somewhat slippery, although not more so than most other floorings, and on the whole gives satisfaction.

## DRAINAGE.

One sanitary principle is common to nearly all military stables, and that is the system of drainage known as "surface." The term surface drainage simply means that there are no drains at all, as the term is usually understood, within the stable, but simply shallow wide gutters running behind the stalls from end to end of the stables, each stall being made with a central depression, communicating with the main gutter which has its exit, or exits, from the stable in a convenient place, or places, through the stable walls and is then taken for some distance, still as a surface drain, until it communicates with a trapped sink, and so with the drain proper. We could not have a better system of drainage for stables of any kind. It allows the most thorough cleanliness, and sewage emanations into the interior of the building are practically impossible. The stable gutters should be shallow, and the exits through the walls large enough to be easily cleaned. These exits might be provided with shutters for use at night, or in cold weather, with advantage, as, frequently, a cold wind blows through them with some force and the horses near them suffer accordingly.

## STALLS.

Stalls should not be less than eleven feet in length from front to rear, and six wide. Where bails are used the width may be decreased a little. These bails are, as you know, of iron or wood. They swing upon chains, and so give a greater freedom of movement to the horse than fixed divisions would do, and also economize space. Bails of modern construction are made with a slip hook, fastening at the rear end, so as to facilitate the release of a horse, should one get astride of the bail. The great object of bail divisions, apart from economizing space, is to prevent horses from injuring one another, and when properly hung they answer this purpose fairly well. If hung too high horses can do one another considerable injury by kicking under them, while if too low they kick over them, and easily get astride of them, or "over the bail," as it is termed. I have generally found that a bail hung to correspond with a line drawn from the elbow joint to just below the stifle is at a very good height. It is too low for a horse to kick underneath, and not high enough to do an animal serious injury should he get across it. Horses sometimes injure themselves by rolling under the bails.

Objection has been raised to the use of this kind of division, but nothing better has, so far, been adopted. Stall divisions are unsuitable for troop stables, as they would interfere with the free circulation of air, require more superficial space per horse, and also be obstructive to efficient superintendence. The method of hanging bails on heel-posts has also been objected to, the heel-posts being objectionable owing to the tendency some horses have to kick at them, and so injure themselves between the hock and the fetlock. But this can be remedied in these cases, in some measure, by wrapping the heel-posts with straw ropes, as previously suggested for remounts; and moreover, horses that would kick at heel-posts would probably amuse themselves by kicking at the bails were the former removed. I consider the method of swinging bails from the roof by means of chains to be very objectionable, the length of swing allowing horses to do pretty

much as it pleases them as regards kicking one another. Wooden dashboards, about a foot deep, and two and a half inches thick, are sometimes suspended below the bails in the cases of kickers, and appear to answer the purpose of preventing injury to other horses. Sixteen per cent. of these boards are now allowed for this purpose.

In some countries rope mats are used, hung in a similar way, and are no doubt very useful, but they collect dirt and soon smell very badly. They are also difficult to keep clean, and the system is not one which agrees with our ideas of cleanliness in a stable. Nevertheless we might find these mats of use occasionally.

A few spare stalls should be retained in each stable to enable special treatment of any particularly nervous, vicious, or tricky horse to be carried out. The number to be retained for this purpose will, of course, depend upon the size of the stable and the number of horses it is nominally intended to contain.

#### MANGERS AND HAY RACKS.

Mangers and hay racks should be of iron and on the same level, and should not be more than three feet six inches from the floor to the upper surface of the manger. If higher than this small horses are inconvenienced while feeding, and frequently learn to bolt their food, while if lower they are dangerous owing to horses being able to get their fore feet into them, as well as frequently striking their knees against the bottom of the manger or hay-rack.

#### COLLAR CHAINS.

Military horses are usually fastened up by collar chains passing through holes or rings near the manger, the chain being prevented from being drawn through the hole by an iron log fastened at the lower end. The length of this chain is of some importance; as, if too short, it prevents the horse from lying down comfortably; and, if too long, gives him too much liberty. The proper length will depend greatly upon the height of the hole or ring from the ground.

If high, a longer chain will be necessary than if low; but, if the height be about three feet six inches from the ground, then a good length for the chain will be that of the height of the horse's nose from the floor when raised into the natural position.

#### LIGHT.

Light is very essential in a stable, not only for purposes of supervision, but also for the health of the horses; and here we find a very marked difference between old and new pattern stables. Most of the old stables are very dark, while the new are very well lighted. We can scarcely have too much light in military stables, and it is mainly for this reason that modern stables are constructed in such a way that the horses in them will face the outer walls, and so obtain the advantage of having a small window over each stall, or over every other stall, and also be in a position to obtain the benefits such a mode of construction offers for ventilation purposes.

#### VENTILATION.

I need not say how necessary good ventilation is to a stable, and to en-



sure this our best stables are constructed with roof or ridge ventilators, in some cases running from end to end of the building, in others being placed at intervals. In stables having the men's rooms above them this cannot be carried out, and here windows should be placed close up to the ceiling. The best kind of window for this purpose is one after the pattern of the Sheringham valve, the sash opening at the top, on hinges at the bottom, and falling backwards and inwards into a frame closed at the sides, thus preventing a direct down draught. Ventilation is also ensured where windows and doors are closed by means of one or more tiers of perforated bricks placed close to the ceiling or under the eaves, and another row about a foot or so from the floor under the mangers. The amount of fresh air introduced by these means is an important factor in ventilation; but it is very seldom necessary or advisable to entirely close all the windows. Care should be taken that these air bricks should be always kept free from dirt and rubbish, otherwise they become practically useless. It is common enough in military stables, and others too, for that matter, to find the means of ventilation within reach blocked up by hay, straw or other material, and this should be strongly discountenanced. It is generally the result of misapplied zeal or ignorance, and a little explanation will frequently put a stop to the practice.

#### DOORS.

Doors should be wide and high, and should either be made to slide, or to open outwards in top and bottom halves, and the fastenings should be simple and without dangerous projections.

#### WATER AND FOOD.

I will now pass on to deal with the water and food of our horses. Horses should invariably be watered before being fed, and the reason is this:—The horse's stomach is very small in comparison with the size of his body and large intestines, and is intended only as a receptacle for food, water passing through it on its way to the large intestines, so that food in the stomach would most probably be washed undigested into the small intestines, and there act as an irritant, and cause colic, and other intestinal derangements. The water should, when possible, be soft. Very hard water is apt to cause intestinal and skin affections. Horses should be allowed to drink as much as they like, as a rule.

Under ordinary circumstances the food consists of oats, bran, and hay, with straw for bedding. This latter, of course, is not issued as a portion of the food ration, but, nevertheless, is by many horses eaten to a large extent. The scale of ration, as you are aware, varies very little; for, with the exception of Army Service Corps horses doing work at a trot during the winter, and for horses of that corps over 16 hands high, no difference is made between our light and our heavy horses. Whether this is a sound rule is, I think, open to exception. It is argued that, if the ration of 10 lbs. of oats and 12 lbs. of hay is only just sufficient for light cavalry horses, it is too little for those of heavy cavalry and artillery; while if sufficient for the Heavies it is too much for the Light. Now, I do not suppose for one instant that any light cavalry officer will admit that the ration is too large for

Hussars or medium cavalry. It is not. Therefore, it is not surprising to find that heavy cavalry officers maintain that the ration fixed for their horses is not sufficient to keep them in as good condition as they should be. Another 2 lbs. of oats per horse per day would make all the difference; and although this addition to the ration would add considerably to the expense of the cavalry, the improved efficiency of our heavy horses would, they say, quite justify the outlay. As it is, by stinting the bedding at one time—economizing you may term it if you please—saving a pound of oats at another, and so on, taking every advantage of the system of forage equivalents, some regiments and batteries, or other units, are able to save sufficient during the winter months to increase the ration during the period of harder work; but this should not be necessary, and, under a properly arranged system of dieting according to size and work, would not be required at all. Some other armies, and notably the German, have a sliding scale adapted to the size of the horses, the weights they have to carry, and the work they have to perform; and although I do not think we have much to learn in the way of horse management from other nations, in this particular we might perhaps do well to follow their example. Even with the present arrangements and under existing regulations we are able to vary the ration a little according to circumstances. Thus, when bedding is not required—as when horses are picketed out, or in camp—an extra 2 lbs. of oats are allowed in place of the straw; and, as much of the hay is wasted when horses are in the open, it would, I think, be a good thing to try the effect of reducing the hay to 9 lbs., and so increase the oat ration another 2 lbs.; 2 lbs. of oats being allowed for 3 lbs. of hay. In this way the ration would consist of 14 lbs. of oats and 9 lbs. of hay. And I leave it to those interested in this matter to consider whether or not this would be a good working ration. The hay should be given in nets with large meshes to prevent its being blown about and wasted; and I am very glad to see that a net with five inch meshes has recently been adopted for use in camp for this purpose. I have advocated the adoption of such a net for some years, and especially alluded to it in my previous lecture. Some regiments have lately had a few, for experimental use, and have been very well satisfied with them.

It is hardly necessary for me to remark that the oats and hay issued as food for our horses should be as good as the conditions of the contract will permit. Every mounted officer and man should make himself thoroughly acquainted with these conditions and with the appearance of good oats and hay. The contract states that—

Oats should be good, sound, sweet, dry, and thoroughly cleaned from stones and dirt, without any admixture of foxy or mow burnt oats—that is, oats that have fermented—and shall weigh not less than thirty-eight pounds per imperial bushel. (A very light minimum weight.)

Hay should be good, sweet, dry, and clean, and may be meadow hay, clover, or mixture, and not of the same year's growth till after the first of October.

Straw should be good, sweet, clean, and dry, in trusses or bales, and shall be wheat, oat or rye (barley straw not being permitted, being supposed to engender parasitic diseases).

Certain equivalents are allowed by the forage regulations to be issued, if required, in lieu of oats or hay. Thus barley, bran, malt, oatmeal, carrots, green fodder, linseed and mangold wurzel, may be issued in place of a fixed proportion of oats or hay, and in this way, and by these means, the food may be varied when necessary.

Green forage is sometimes issued in the early summer months and in moderation is very beneficial. If given in excess it induces diarrhoea.

Straw is issued for bedding in barracks; and, with good management, the ration of 8 lbs. per horse should be sufficient. It requires great care and attention to prevent waste; a large proportion of straw frequently being wasted by careless men and thrown away with the stable refuse. The bedding should never be dried in a hot sun, as this makes it brittle and tends to waste; and, when dry, it should at once be gathered up into as large heaps as circumstances will allow.

#### OAT-CRUSHERS AND CHAFF-CUTTERS.

It has been suggested to furnish the barracks of our mounted troops with oat-crushers worked by steam, water, or other power, and much may be said in favor of giving our horses crushed oats, especially when crushed under our own supervision. The horses would obtain the full benefit of this portion of their ration, fewer, if any, oats passing undigested—but, unfortunately, there is much to be said against this method of feeding. If we could ensure our horses getting their oats crushed on all occasions, on the march, in billets, on active service, and in every barrack or place in which they might be quartered, there would be less objection; but, as in all probability, every barrack would not be supplied with a crusher, and, as it would be practically impossible to obtain crushed oats on the line of march, or most of the occasions mentioned, we should have our horses falling away in condition just when condition is most required. Horses fed on crushed food, unless it is well mixed with chaff, learn to bolt it, and this they would then do with whole oats, for a time, and in this way would lose the benefit of a large portion of their food, which would be passed undigested. If, however, a *chaff-cutter worked by steam or other power*, were furnished to each cavalry barrack there would then be less risk in the introduction of crushed oats; for, by the admixture of a proportion of hay-chaff, horses learn to masticate their food thoroughly, and, as far as mastication goes, it would not matter so much whether the chaff were mixed with whole or crushed oats. Hand chaff-cutters are now in use in barracks of mounted corps, but they are unpopular with the men and not seldom out of working order. Each horse should have not less than two pounds per day of hay-chaff, and this means, in a cavalry regiment of ordinary strength, that something like eight hundred pounds per day of chaff would have to be cut by hand—a considerable amount of manual labor. A cutter worked by steam, water, or even horse power, would do the work in less time, and would not be unpopular with the men. Moreover, the power necessary to work such a machine could be turned to other use as well, including oat crushing.

#### CONDITION.

The word "condition" is used as applying to horses under widely vary-

ing circumstances; thus "trainers" condition is a very different thing from "dealers" condition; the object of the trainer being to have every organ, nerve, and muscle of the horse's body in the very fittest state to undergo severe exertion, without exhaustion, at a given time; while the dealer on the other hand endeavors, as a general rule, to present his horses to would-be purchasers fat and sleek. Our object with army horses should be to retain them in good working condition, with just sufficient fat to act as a reserve of heat and force in the event of occasional necessary abstinence from food and exposure to cold; and this, I think, is only to be attained by steady, but moderate work. A system by which horses are made to endure severe and prolonged exertion on one or two days in the week, with little or no work on the others, is not a good one, especially during the winter months, when, owing to the length and weight of their coats, our horses sweat a great deal. Two or three hours well regulated work daily—not watering order—each horse saddled and mounted, and carrying a fair weight, would, I think, when combined with careful attention to grooming, food, and water, do much towards rendering our horses capable of undergoing, without waste, any extra exertion occasionally required of them, and would, moreover, keep their backs in hard condition and less likely to become sore.

Here, again, we are met with a difficulty. Commanding officers say this cannot be done during the winter months, owing to a large number of men not being available for duty—recruits, employed men, men on furlough, &c.

#### WEIGHTS OUR HORSES CARRY.

I really think some determined attempt should be made to decrease the enormous weights our cavalry horses carry in marching order. They vary from 19 stone to 22 stone, or thereabouts, and the artillery horses have, in addition to carrying a heavy weight, to draw another 7 or 8 cwt. The question—Is it absolutely necessary that this should be so?—is one for serious consideration.

Under very pressing conditions we can, of course, reduce the weight carried very considerably, but, under the ordinary circumstances of active service, it is only what, perhaps, for want of a better term, I may call luxuries, that may be reduced. The rider's arms and rations, and the horse's forage and spare shoes, must be carried. To enter on a campaign or an extended operation, with any of the actual necessities left behind, would, I think, probably lead to very serious inconvenience or perhaps disaster, and to a mounted man, the horse's spare shoes and nails are of the utmost importance. I shall refer to this latter later on, when I hope to show the importance of the horse being properly equipped, as well as the rider, but if we can possibly reduce the weight in other ways we ought to make a strong effort to do so.

#### GROOMING.

Horses in a state of domestication and active work require to be groomed, and none more so than army horses. Grooming removes dust, dirt and skin particles—scurf—from the coat. The friction of the brush or wisp induces a healthy action of the skin, promotes the activity of the sweat

and oil glands, and in this way gives a smooth, glossy coat, and renders it to an extent waterproof. The brush should have long bristles to penetrate the coat, and should be used firmly and methodically. It is a bad practice to use the curry comb on the body of a horse. Its use should be restricted to that of cleaning the brush only. There are certain parts of the body which require very careful and particular attention from the groom, and, I am sorry to say, they do not always get it, even in very good regiments. These I term "essential points of grooming," and they are—careful sponging of the eyes and nostrils, scrupulous cleanliness of the mane, tail, and dock, and, in geldings, the sheath also. It is a common thing to find the surface of the mane or tail beautifully clean and glossy, but, when the under-surface is examined, it is found to be clogged with scurf, dust and dirt; or, if not so bad as this, distinctly not clean. Nothing tends to a horse's comfort more than strict attention to these points. If a horse is seen to be rubbing his tail or mane, in nine cases out of ten the cause is a dirty state of their under surfaces. On one occasion a horse was brought to me for rubbing himself in this way, and, of course, the cause was dirt. I asked the young soldier who brought him if he had not been told and shown how to clean those places. He said no; no one had ever shown him. The horse was otherwise quite clean, and would have passed a casual inspection easily. This want of method in grooming is, I think, the result of the men having in many cases to learn to groom as best they may. They imitate what they see being done, but seldom does anyone take the trouble to explain the why or wherefore of what they do. This would be remedied if it were possible to detail a smart dismissed man to instruct young soldiers practically in the art of grooming horses quickly and well. I am well aware that this is not always the case, and that, in some corps, considerable trouble is taken to instruct the young soldier in this part of his duty.

#### WASHING.

Washing should be avoided, especially immediately on return from muddy field days. As much of the mud as possible should be scraped off, and the rest allowed to become thoroughly dry, when it may be brushed out. The skin affection known commonly as "mud fever" is almost always caused by grooms washing off mud and neglecting to thoroughly dry the part afterwards. Cracked or chapped heels are caused in the same way, and are nearly always a sign of laziness and neglect in the groom. The practice of "hanging horses out to dry" on return, wet and sweating from a field day, is a most pernicious one. On warm bright summer days, and when the wisp is well used at the same time, there is not so much objection, if done under supervision, but the time usually chosen is when there is a nice cold wind blowing, easterly or northerly for preference, and the man amuses himself by toying with the legs and feet while the wind dries the body. This is not an overdrawn picture. I have seen it again and again. Sometimes it is done openly, but more often surreptitiously, and the non-commissioned officers wink at it. The practice should never be allowed, except when properly authorized and under the supervision of the officers. The feet should be thoroughly dried when washed out.

## CLIPPING.

A few remarks on clipping will not, perhaps, be out of place here. Many cavalry officers are in favor of entirely clipping army horses, although there are strong arguments against such a practice. Clipping is said to be almost equal to an extra feed of oats. It lessens waste by almost entirely preventing profuse sweating; decreases the risk of chills, owing to the coat becoming less wet, and drying more readily; saves an immense amount of labor in grooming, and tends to much more cleanliness. Of course clipped horses would require blankets, and this would be an extra expense, which, they say, would, nevertheless, be quite compensated for by the increased efficiency of the horses. Clipping is practically universal in Northern India during the cold season, and I am not aware of any evil results having arisen therefrom. The legs should not be clipped, the hair being a great protection from cold and wet; and, moreover, they cannot be covered by blankets like the body. The arguments against clipping include the extra expense of supplying and maintaining blankets, the risks attending the possibility of military horses being required for active service during wintry weather, or of standing for hours during winter drills. With the exception of active service they would be required to do very little, if anything, more than horses in civil life do daily, and it would be interesting to see the experiment tried of clipping a whole regiment, supplying them with blankets, and then otherwise treating them precisely as if they had not been clipped. We have gone a little way in this direction by clipping the bellies and insides of the legs, from the knees and hocks upwards, with considerable advantage to the horses and saving of labor to the men.

## SADDLES AND SORE BACKS.

I do not propose to enter particularly into this subject, as we have a very useful manual written by Veterinary-Captain F. Smith, late Professor at the Army Veterinary School, wherein he enters very minutely and carefully into the fitting of saddles and harness, the causes of sore-backs, shoulders, withers, etc., and the methods of fitting calculated to prevent such misfortunes; but I would, all the same, again endeavor to impress upon everyone the very great necessity for attending at once to every little chafe—no matter how slight—and removing its cause, and, for this purpose, constant and unremitting attention to saddle and harness fitting is necessary. Horses alter in condition, and saddles with wear, so that frequent inspection is highly necessary.

## THE FOOT AND SHOEING.

I think most people, at all events those accustomed to horses, have come to understand that the horse's foot is not a solid block of horn to be hacked at and disfigured at will; but few actually realize what a beautiful and complicated piece of animal mechanism exists within the outer wall, or horny box, of a horse's foot; each part exactly arranged according to the work, or part, it has to perform. The elastic cushions to ward off concussion from the more delicate parts; the beautiful arrangement of sensitive and horny laminae, forming a most intimate, and yet most elastic connection between the bony base or pedal bone and the outer protecting horn;



nature's arrangements for the growth and repair of that horn, as well as that of the sole and frog; the arrangement of the tendons at the back of the foot—the large flexor tendons playing over a fulcrum formed by the navicular bone being another mode of decreasing concussion—the whole forming one of the most marvelous and admiral arrangements to be found in nature. It is, therefore, our duty in caring for the horse's foot to see that we do as little as possible to interfere with Nature's arrangements, while at the same time adapting the foot as far as we can to the requirements of civilization.

We find that, as a general rule, the proper angle at which the fore foot is set on gives a slope from the ground surface of about 45 degrees to 50 degrees, while the hind foot is, or should be, at an angle of about 50 or 60 degrees; and, in preparing the foot for the shoe, care should be taken to maintain these angles as nearly as possible, although I admit that there are many cases when this cannot be done. The hind foot should, however, always be more upright than the fore. This is not infrequently overlooked by farriers and shoeing smiths, and the hind feet allowed to splay out in front or "run to toe," and when so cannot be readily altered. This should not be. The hind foot should always be fairly upright.

From time to time we hear a great deal about the possibility of horses going bare-foot, carrying weight, with great success; and its advocates argue that army horses could do likewise. Well, they cannot. Circumstances are entirely against their doing so. The weights they have to carry are very great, and although during peace, in India, most cavalry horses are unshod behind, yet, when required to do prolonged work over indifferent, and frequently rocky ground, they quickly become foot-sore and require to be shod. The same thing occurred in Egypt with the Syrian horses ridden by the 19th Hussars during the Suakin and Nile campaigns, and if these hardy little horses, with, as a rule, good sound feet, accustomed from birth to go bare-foot behind, could not in a dry climate carry our light cavalrymen without requiring to be shod, it stands to reason that European horses in a European climate—or in fact any climate—would utterly fail if required to work without shoes over macadamized roads, and through the mud and wet of ordinary campaigns. The horn of the horse's hoof absorbs water readily, and so would become soft and easily subject to wear and tear, which the shoe prevents. Apropos of this absorption of water by the horn, there used to be an idea prevalent (though now pretty well exploded) that it was necessary to keep the sole soft and elastic to allow of its descent during motion; and, for this reason, the horny sole was pared considerably, and stoppings of cow-dung and other filth used to keep it soft. In this way the sole was robbed of its thick protection and became subject to bruises, while the stopping induced diseases of the frog. Stopping is not only unnecessary, but positively harmful, and the sole and frog should not be touched with the knife more than is necessary to remove ragged portions of horn. As regards the outer wall of the foot, the portion to which the shoe is nailed, this should never be touched with the knife, the rasp being, as a general rule, all that is necessary to remove the growth of horn in order to make a bed for the shoe. As to this latter I will not weary you with descriptions of all the various kind of shoes and lumps of iron that have been devised to protect

or injure the horse's foot. Simplicity of form is desirable, and a rim of iron made with a view to what is required of it, shaped according to the anatomical arrangement of the parts it has to protect, and fastened by as few nails as possible, is all that is necessary for general use. In the army we are always being asked for a shoe, and a system of shoeing, that will always meet any emergency and never fail under any circumstances. Well, we have not yet arrived at such perfection; but I think I can safely say that our present system is far in advance of any that has preceded it, and that although not perhaps perfection, it will, before long I hope, fairly satisfy all our requirements for peace or war.

In shoeing care should be taken that the shoe is made to fit the foot and not the foot to fit the shoe. Rasp marks should not be seen on the outside of the wall of the foot. They usually are a sign of ignorant or careless fitting. The nails should not be driven high, and the height to which they are driven should decrease towards the heels where the horn becomes thinner than elsewhere. The foot should be brought well to the ground so as to obtain for it equality of pressure where pressure is intended to be borne, that is, on the wall, sole, and frog, but more particularly the wall and the frog. If this be done, and reasonable care taken in shoeing, the sole and frog will soon require little or no attention, and the horse's foot will remain in a healthy condition. I do not think I am wrong in saying that shoeing is the most important operation horses have to undergo; and the old story about the loss of a nail causing the loss of a shoe, and so the loss of the horse and rider, and on to the loss of a campaign, is not much of an exaggeration. We ought, therefore, to give every encouragement to good shoeing and the care of the horse's feet.

#### FARRIERS AND SHOEING SMITHS.

This lecture will hardly be complete without a few words about farriers and shoeing smiths.

I should like to see a large establishment of trained farriers and smiths maintained in mounted corps. These men are not turned into finished workmen in a day, and two years is the very shortest time in which an intelligent man can be made a fairly expert shoeing smith, able to make shoes and nails from the raw material, and to shoe horses sufficiently well under the varying conditions of the service. It is true that an intelligent cavalry man can in three months or so be taught to *put on* shoes, and I should like to see as many as possible taught to do this; but these men could not be entirely relied upon; they would not understand more than just taking off or putting on shoes. Another reason for maintaining a large staff of farriers and shoeing smiths is the high percentage of casualties among these men on service. This is not surprising when inquired into, for we find that they not only have to do duty in the ranks, but, when others are resting, have to be at work, making or fitting shoes, and in artillery and transport repairing carriages as well, and frequently under a burning sun; for this work cannot be done in the dark. Casualties among farriers and shoeing smiths increase the work of those of them that remain, and, without a large establishment to start with, a campaign of moderate duration would tell a very

unpleasant tale. As I have said before these men are not made in a day, and very few trained smiths now enlist. It has been said that with a supply of machine-made shoes we could do without farriers or shoeing smiths. Well, I hope I shall not see it tried. Even with such shoes a large proportion of trained men will be necessary, as horse shoes cannot be made to fit every foot without alteration, and only trained men can effect this satisfactorily.

## CONCLUSION.

I did intend to say something about the stopping effect of the small bore bullet upon horses, but, on consideration, I do not think we have sufficient reliable data upon which to found an opinion upon this matter; for the effects of these projectiles upon dead bodies appear to be so different from those upon the living, and no large cavalry engagement with European troops having taken place since the adoption of the small-bore rifle, fitted with a magazine, I do not think it is possible to arrive at any really satisfactory conclusion. We know that the bullet of the Lee-Netford rifle is capable of pulverizing bones, and of producing terrible effects in that way; but whether the shock of impact in a non-vital part is, or will be, sufficient to prevent a horse from reaching a given point is what we have yet to learn.

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LECTURE ON ARTILLERY MATERIEL, DELIVERED  
BY LIEUTENANT GENERAL ENGELHARDT.

*From the Revue d'Artillerie.*

By First Lieut. GEO. W. VAN DEUSEN, 1st U. S. Artillery.

**L**AST March General Engelhardt, Inspector General of Artillery, delivered a very important lecture on recent improvements in artillery to the staff officers in the vicinity of St. Petersburg, in the presence of the Grand Duke Vladimir, Commander-in-chief of the army and the Grand Duke Michael, Chief of Artillery.

The high professional standing of General Engelhardt, and the leading part which he has taken for more than twenty years in the development of the Russian artillery, makes this lecture of an especially interesting character. Two years before, in March, 1893, during another lecture, the general had set forth the necessity for a complete revolution in field artillery. After an examination of the efforts already made by manufacturers and theorists, he described the ends to be obtained and laid down the methods for obtaining the desired improvements. Since then some of these have been realized.

In the lecture recently delivered, the general proposed to give an outline of the improvements made in the Russian artillery to show how much it had advanced from where it previously was. With the exception of some minor details, the account given below is the one published in the "Rouskii Invalid." During a number of years artillery was passing through what might be called a period of fermentation, a natural consequence of the great

advances made in manufacture. These advances have excited a vast profusion of theories and discussions regarding all the important questions in which the artillery is interested.

Concerning field artillery there has been nothing especially confusing to the mind for reasons to be given later. But quite the reverse is the case regarding siege and marine artillery for the reason that, given guns and materiel of large calibre, it is far more difficult to make the experiments by which alone can the practical value of a theory be demonstrated.

In this connection, the events happening in the Chinese-Japanese war have recently furnished a series of opportune and instructive illustrations taken from actual experience on the field of battle. Even before this, the loss of the English battle-ship *Victoria*, occurring as it did during manœuvres in time of peace on account of the difficulty in handling her great weight, had caused naval constructors to reflect and to mark time in their tendency to increase weight and power to an exaggerated degree. The lessons of the naval combat of the Yalu can only confirm this return to healthier ideas by putting to the front in so conspicuous a manner the advantages of manœuvring qualities combined with the great rapidity of fire to be obtained from the smaller calibre guns, over the comparatively feeble return fire given by the immense guns on heavy vessels.

The causes which militate against the use of these immense guns as naval artillery, are, even to a greater degree, valid regarding guns to be mounted on land. In the first case, the employment of steam and electricity to a great extent on board-ship is comparatively easy, while on land these forces can be much less easily utilized. For the defense of fortifications as understood at the present day, a degree of mobility is required from the guns quite incompatible with extreme weight.

Among those auxiliary designs which do not seem to be appropriate for practical use with artillery of large calibre under fire may be classed the very bulky arrangements of machinery and gearings designed for the purpose of utilizing the force of recoil for various ingenious purposes, but which only encumber and add to the weight of machines which should be, above all, simple in design in order that they may properly carry out the purpose for which they are constructed. This observation is not intended to apply to the comparatively simple mechanisms in the Canet system which are justly entitled to consideration since they allow the manœuvring of the pieces with a greatly reduced number of men.

*Field Artillery.*—In the domain of field artillery, comparatively few important changes have been introduced in Russia during the last eighteen years, steel guns having been adopted into the Russian system in 1877. As a consequence, comparatively few serious errors have been committed in that branch of artillery during the period of fermentation mentioned above. Field artillerists have not been thrown without consideration to the tender mercies of numerous inventors, each one with a ready-made system of artillery. The possibility of executing experiments, practice marches, manœuvres and drills on a large scale in time of piece gives the field artillery the best possible opportunity for testing practically all the proposed improvements. Indeed it is not rare that the tests made in peace are much more

severe than those that would be experienced on a campaign. At any rate, it is justly considered that these tests are indispensable for determining the real value of any system constructed on new lines. The mere theoretical demonstration, here as elsewhere, must be looked upon with suspicion as lending itself too readily to deceptions.

Concerning the so-called "gun of the future," the theories of General Wille are somewhat inconsistent upon certain points. This officer holds it to be most important to increase the initial velocity of projectiles to the extreme limit. In this connection he has not taken into sufficient consideration existing conditions and that metallurgy is far from being able to produce the metal for such a gun as he proposes.

Furthermore the great flatness of trajectory due to too great initial velocity is not without drawbacks when it becomes a question of firing over the heads of troops, or of searching out an enemy taking advantages of irregularities in the ground. Finally, the most important function, the increase in striking velocity of the projectile, is far from being proportional to the increase in initial velocity.

This last fact is shown by the following figure which gives the velocities at different points of the trajectory for the light 87 mm. gun actually in use in the Russian field artillery, and for the projected gun of General Wille. From this we see that the latter gun, notwithstanding its great initial velocity, gives only a relatively small gain in striking velocity at fighting ranges. So that this gain, admitting that it would be possible to realize it

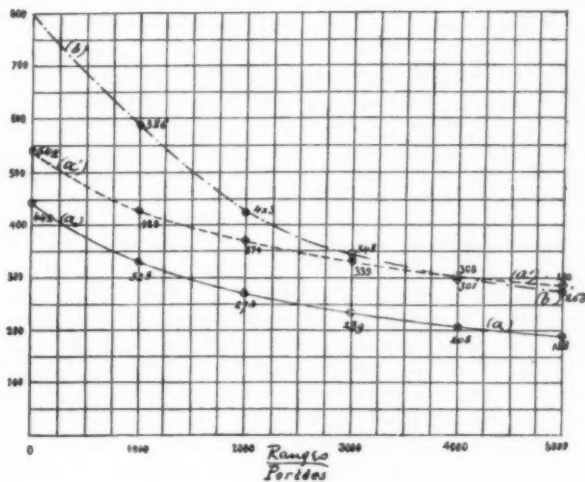


Fig. 6.

to-day under the given conditions of weight and calibre, would hardly seem important enough to justify the great expense involved in the construction of a new system.

*Increased Efficiency of Shrapnel.*—It now becomes necessary to see if the increase in striking velocity so desirable for this class of projectile can not be obtained in some manner just as efficacious and involving less labor and expense, that is, may it not be possible to increase the killing power of shrapnel balls without changing the gun?

The following method has long been advanced theoretically, but has not worked in practice up to the present time. It consists in so constructing the projectile that when it bursts, not only are the balls liberated but an increase of velocity given them. In other words the projectile is really transformed into a small mortar which goes into action at the desired point.

As the result of experiments undertaken by the Russian government, a projectile fulfilling this requirement has just been adopted for the field service, and the increase in velocity given to the balls is about 100 metres.

The dotted curve traced on the preceding figure shows the value of this reserve force which is latent in the projectile up to the time it is needed and which, for useful ranges, increases the remaining velocities of the present guns to such an extent that it leaves nothing to be desired when compared with the "gun of the future." The true importance of this result will be appreciated when compared with that obtained in 1877, when after the expense of an entire change of system and adoption of steel guns, there was obtained an increase in initial velocity of only sixty metres and a very insignificant increase in striking velocity.

In conclusion, it would seem that the expense involved in the construction of a new system would be entirely out of proportion to the advantages obtained, especially since the adoption of the new shrapnel.

*Better Application of the Properties of Smokeless Powder.*—It would be showing a poor appreciation of the advantages of this new powder not to utilize its projective force to gain the several hundred metres velocity consistent with the resisting power of the gun. It was certainly a singular delusion which considered the chief advantage of this powder to be the absence of smoke, quite a secondary consideration compared with that to be obtained from its ballistic qualities.

*Rapidity of Fire.*—Along with the interesting problem relating to the efficiency of the individual projectile, is another important question of the day, that of rapidity of fire.

The advantages of being able to use rapid fire under certain definite tactical conditions are incontestable to-day. The question is to know to how great a pecuniary sacrifice we should go to construct field artillery fulfilling this condition. On that will depend the solution of the problem.

To the foreigner this question seems to mean a reduction of calibre and the use of fixed ammunition.

The reduction of calibre certainly tends to increase the rapidity of fire, but is inevitably coupled with that heavily expensive operation, a complete change of materiel. It means also the serious defect of diminishing to a marked degree the total number of balls which a battery transports in its shrapnel. This loss would be about one-fourth in passing from our present calibre of 87 mm. to that of 75 mm., which seems to be the one generally in favor. Such a decrease in the number of balls is not sufficiently counter-



balanced by the increased lightness of materiel, especially as the mobility of the present Russian light system is very satisfactory.

Fixed ammunition has many defects which are often quoted. However it should undoubtedly be adopted if by so doing the rapidity of fire could be increased. But it does nothing of the kind and for the following reason :

The minimum time separating two shots fired in succession from the same piece is divided into three periods, that occupied by the recoil and return into battery, by the loading and by the aiming. Up to the present time, on account of the position occupied by the breech sight with respect to the breech block, the two last operations, loading and aiming, have been performed in succession. This method is certainly defective. It is simply necessary to move the sights slightly towards the muzzle so that the opening of the breech ferreture will be free during aiming, and then both operations can go on at the same time.

If the possible simultaneity of these operations is admitted, then the only important thing about them in connection with rapid fire is the comparative length of the two. Now from long experience it has been shown that aiming takes more time than loading, under ordinary service conditions with the projectile and cartridge separate. Granting that the sight is moved to the front so that loading and aiming can go on at the same time, the adoption of fixed ammunition would be entirely unjustifiable, since we would be accepting all its defects without gaining anything from it in rapidity of fire. Changing the sights to the front has already been accomplished by simply providing the piece at convenient points with seats to support the sights.

*Checking Recoil.*—It has been stated above that the time between two consecutive shots is divided into three periods, and we have already discussed the relations existing between the two coming last in order of time.

There remains the other period, the recoil and return into battery which is the more important that it is longer in duration than the other two. We may be sure that the most thorough remedy against slowness in firing is to suppress recoil as much as possible, and it is to effect this result that the efforts of all constructors have been directed with more or less ingenuity for the last ten years.

Practically, for field artillery, it is not essential that all the recoil should be suppressed. In the case of a carriage furnished with a spade brake on the trail, it would be satisfactory to have it recoil sufficiently at the first shot to anchor the spade solidly in the ground, if after that the recoil should be very small.

*New Carriage with Spade Recoil Check.*—It was following this idea that the carriage was constructed which has just been adopted by the Russian government as the result of a long series of experiments, and which has the especial advantage of using materials on hand with but little additional expense.

The recoil is checked by means of a trail spade with an elastic connection, the body of the carriage being, as at present, joined to the axle by means of rubber pads or washers.

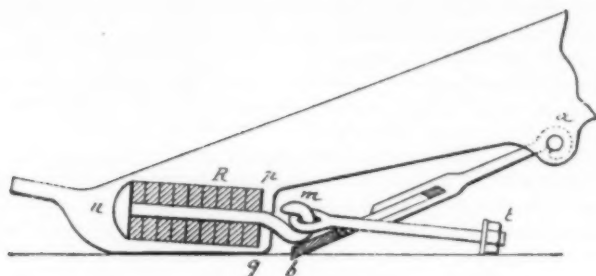


Fig. 1.

Figure 1 represents the carriage in battery before the first shot. The spade, "a, b," is ready to dig into the ground. The trail plate resting on the ground is made of a broad steel plate which projects considerably on

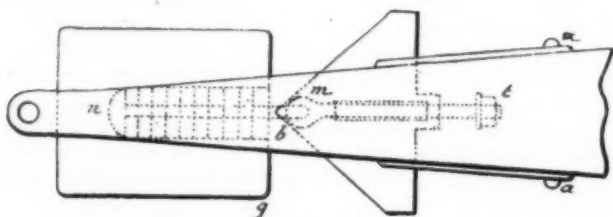


Fig. 2.

each side of the trail, and by its breadth prevents the trail digging into the ground, assures its stability and secures the proper action of the spade (see Fig. 2).

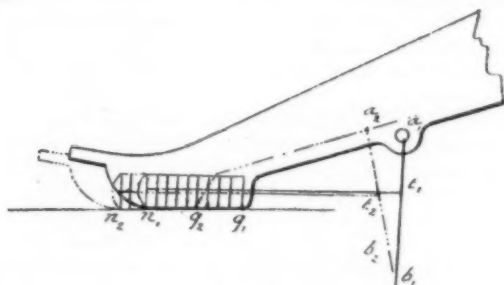


Fig. 3.

This latter pivoted on an axis "a, a," is joined to the trail as shown at "n, t." by two straight rods joined at "m." Upon the rear rod are strung several rubber washers held between a mushroom plate at "n" and the transom of the trail, "p, q." The front rod "m, t," slides freely through

the spade and ends in a large nut "t," which serves as a support for it at the moment before firing. On the march the spade and sliding rod are held up by hooks fastened to the flask.

Figure 4 shows the shape of the spade, which was adopted as the result of a large number of experiments with every possible shape. The position of the axis "a, a," is of great importance in determining the proper action

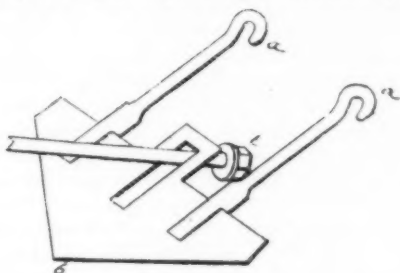


Fig. 4.

of the whole; this axis should be placed as near as possible to the centre of percussion of the carriage.

When the first shot is fired, the point of the spade enters the ground; the trail recoils carrying with it the rod, and the nut is thus brought against the front face of the spade. The rod is then in the position, "n, t," figure 3. On leaving that position, the rubber springs are compressed and the motion of recoil reaches its limit in the position "n, t<sub>2</sub>." At this instant, the spade being solidly imbedded in the earth, a reaction is produced in

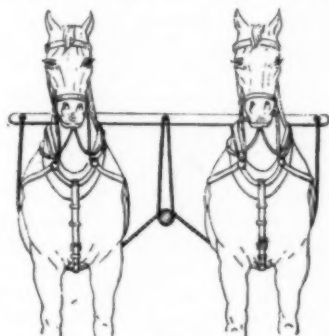


Fig. 5.

the elastic springs and tends to throw the carriage back to the front.

In the succeeding shots the recoil is reduced to a simple oscillation about the point of support of the spade, the wheels returning each time to practically the same place.

Notwithstanding this extreme reduction in the recoil, the carriage is not

subjected to any great strain as in addition to the elastic connection of the spade, the carriage is united to the axle, as already stated, by rubber washers.

For giving direction, the body of the carriage can be given a slight lateral motion along the axle by means of a crank within reach of the man aiming so that he can, at the same time, give both elevation and direction. This improvement was invented some time ago by the engineer Baranowski.

The carriage which was used for the experiments was first given a test of 500 rounds in the private proving ground of the factory where it was made, and then of 800 rounds at the central artillery proving ground. During these two series, the average rapidity of fire, the piece being actually aimed for each shot, was  $4\frac{1}{2}$  shots per minute. Possibly this speed may seem rather small compared with the results obtained by certain makers, but the desire to remain at the same time simple and practical forbids us to pass this limit. It would certainly be easy to construct a piece firing more rapidly, but would it be at the same time simple enough to fulfil the requirements of actual warfare? Vaucauson once constructed a very pretty duck which came, went, swam and ate just like a real duck, nevertheless it was only an artistic curiosity, a "museum duck." Let us then guard against "museum guns."

The amount of recoil after the first shot has not averaged over .06 metre. The weight of the new system, piece and carriage, has been increased only 35 k. g. over the system actually in use. Five hundred of these new model carriages have been ordered.

*Supply of Ammunition.*—The increase in rapidity of fire is necessary to meet the conditions arising in modern battle. The effect of the projectiles against any visible target has been so greatly increased that skirmishers, etc., will take advantage of even the smallest irregularities of the ground which will afford them any shelter. To be effective against objectives so scattered and concealed, a large space must be swept by a storm of balls. For this reason, it is not sufficient to supply the artillery with a system theoretically susceptible of executing rapid fire, but means must be provided for keeping up this fire by a more plentiful supply of ammunition than formerly.

With a view of satisfying this requirement, experiments have been made with a new caisson, the carrying capacity of which exceeds that of the present caisson by 50 per cent. This new caisson has two wheels, is drawn by two horses, and is of the same type as the cartridge wagons, model 1892, the adoption of which for ammunition parks has dispensed with about 8000 men and 15,000 horses. Three caissons of the proposed model carry altogether 120 rounds, replacing one of the present caissons carrying only 80 rounds.

The number of horses is not increased by this since each of the caissons is now drawn by six horses and corresponds to three caissons of the new system, each with two horses. This new caisson is of narrow gauge, similar to the cartridge wagons. On account of this reduction in width, two caissons can easily travel abreast as with the cartridge wagons, and so do away

with any objection that might be made as to the elongation of the column due to the increased number of carriages.

It is proposed to use the Spanish method of harnessing for these caissons. In this method (see Fig. 5, page 399) the end of the pole, instead of being supported by the collar about the neck and shoulders, is sustained by a leather strap fastened to a kind of cross bar, one end of which rests on the back of each horse. The experiments made with this method of harnessing have given very good results.

As to the interior details of the caisson, it is proposed to construct a kind of light tray for holding the ammunition and carrying it to the piece, which, being very simple, light and so cheap that it can be abandoned if necessary, will replace to advantage the present ammunition holder, the weight of which is too great.

In conclusion, the ideas forming the basis for the actual changes now going on in Russia in respect to materiel for field artillery are as follows:

*Guns.*—Keep the gun of the present by moving the sights toward the muzzle to permit simultaneous aiming and loading.

Increase the charge of smokeless powder so as to gain as many hundred metres initial velocity as are compatible with the strength of the gun.

*Carriages.*—Preserve as the general type, the present carriage by furnishing it with a spade recoil check with elastic connections, and with an arrangement allowing the man aiming to himself give direction.

*Projectile.*—Give to the shrapnel the secondary charge recently adopted which has the advantage of increasing the striking velocity of the balls about a hundred metres.

*Caisson.*—Abandon the four wheeled six horsed caisson now in use and replace it by a two wheeled caisson drawn by two horses harnessed in the Spanish style.

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## TACTICAL TRAINING OF VOLUNTEER OFFICERS.

(From the United Service Gazette.)

**F**IELD MARSHAL the Viscount Wolseley, Commander-in-chief, presided on Thursday last on the occasion of a lecture on "The Tactical Training of Volunteer Officers, being delivered by Lieut.-Colonel E. J. A. Balfour, London Scottish Rifle Volunteers.

The chairman said that the subject of the lecture was one that must interest everyone who wished to see the Volunteer Force flourishing and efficient. He did not think there were many officers in the Volunteer Force more capable of dealing with the subject than Colonel Balfour.

After dwelling on the necessity of junior officers studying tactics both theoretically and practically, and combating the opinion too commonly held that tactics were necessary for generals and perhaps for colonels, but that drill was all that was required by captains and subalterns, Colonel Balfour went on to observe that even those who would not venture to argue in favor of these prejudices too often reveal in practice the fact that their

perspective is bounded by their own command. I believe, the gallant Colonel added, that if we were to analyze the causes of the mistakes made in manoeuvres we should find that a good half arose from the fact that officers will not consider that they must not play a little isolated game by themselves, even if a pretty opportunity presents itself; but that they must in unforeseen circumstances subordinate their action entirely to the expressed intentions of the chief. They are pawns in a great game. But they are pawns endowed with intelligence and initiative. And this intelligence and initiative must be exercised strictly in accordance with what writers used to call the "rules of war."

The subject of tactics is many sided. In its complete form it involves knowledge of map reading, ballistics, elementary woodcraft, a little astronomy, some engineering, a quantity of military statistics, field fortification—besides, of course, those dispositions of troops of the three arms, regarded as orthodox by consensus of experience in various typical circumstances. But, in addition to these matters, most of which can be, to a considerable extent at least, mastered by the study of books, other elements no less important are essential for the successful practice of tactical principles. The most important of these may, I think, be best grouped under a general heading of "sporting instinct." I know of no sport worthy of the name in which the science of tactics does not play an important part.

Granted a man of average intelligence and education, the fact that he has mastered the theory of the sport will enable him to become a true expert in far less time than if his education in the art had been from the commencement empirical. Not only this, however, he will, if endowed with a fair imagination, rapidly acquire the instinctive application of his book learning. As an illustration of my meaning, let me take a particular case. Supposing I were to show a young officer, fresh from having added a (t) to his name in the "Army List," his position on a large scale map, and were to ask him to show me how he would conduct a rear-guard action in certain defined circumstances, his answer would probably be generally sound, however much he might fail in detail. But supposing I were to say, "You are in command of a battalion, and receive the following order from the general in command of your brigade: 'After yesterday's defeat I am retiring on X; delay the enemy's advance for twenty-four hours,'" it is possible, I will even say in many cases likely, that he will not realize that he has to use his battalion as a rear-guard. Probably he would fight a pitched battle. And then, should I point out that he had not obeyed his instructions to act as a rear-guard, he would probably say: "I was never told I was to be a rear-guard, but, of course, I know all about how to do that." But when he had several times undergone similar experiences, the connection between theory and practice would commence to be established in his mind. He would study the imaginary situation in all its bearings, and would soon learn to bring out of the storehouse of his mind the rules and maxims applicable to the occasion.

The first stage is, and must be, the passing of the Regular examination. The second stage in the course of a Volunteer officer should be the war game. I have already pointed out that the war game, or, as I should pre-



fer to call it, the "map fight," forces each combatant to realize in an elementary way the relations between theory and practice.

Great emphasis is frequently laid on the teaching of "map reading," as a sort of by-product of the industry of war game. I do not wish to underestimate its value. Anything which gives facility in map reading is of itself of great advantage. But sometimes it occurs that the war game, and especially the minor war game, teaches too much, in so far as it leads to a habit of determining the exact position of units from the map alone. A corrective to this has been established in the case of the larger war game by the Home District Tactical Society, by arranging that Kriegsspiels which have been played on a map on one day shall be carried out by the same players on the actual ground on the following day.

Another essential vice of the exclusive use of map fighting, for teaching purposes, is the impossibility of preventing the combatants from knowing a great deal more of the disposition of the troops (especially on their own sides) at any given moment than they could possibly know of the same troops in the field.

Closely connected with this point is the tendency to acquire the habit of changing plans and reversing orders. It is so easy to say that four pieces of lead shall be turned about and moved the other way. It is so difficult to make this change with the brigade, of which those four pieces are the symbols. Everyone who has been in the habit of watching closely the conduct of a Kriegsspiel must have been frequently struck with the free-and-easy manner in which, for instance, changes of front by troops in action, reinforcement of one flank by troops from another and similar movements of great difficulty, are ordered and executed with mathematical precision. Nor is it possible to introduce nearly half the causes which in real business produce confusion and disaster.

But the unrealities of the war game are not confined to matters personal to the players. All the troops engaged are ideal of their kind. The bits of lead have souls above cowardice; they combine the steadiness of the British veteran with the romantic *dan* of the French conscript.

Many pages might be written emphasizing these and similar points. I think, however, that I have said enough to awaken attention to my two main contentions in respect to war game:—First, that its utility is limited broadly to the teaching of the application of tactical principles; secondly, that as soon as it is made to stretch beyond these limits there is serious danger of its teaching becoming absolutely misleading to the student. I am not advocating its abandonment; on the contrary, it is the second step in my proposed system. But it is only a step, and not a very long one.

Still, bearing in mind that our student is as yet unfit, from want of experience, to handle partially trained troops in the field, the third stage of training must clearly be calculated to bring his knowledge to such a pitch that drill and tactics shall in the fourth and final stage become interwoven. The third stage teaches what dispositions and formations are required in the varying conditions of actual ground. The fourth stage will confer the power, by means of previous courses of drill, of executing those formations rapidly and without confusion. In other words, the third stage is to consist

of what are usually termed "outdoor tactical exercises," or "war games in the open."

The volunteer officer who has passed through these three stages of training—namely, (1) book reading, leading up to examination; (2) tactical exercises on maps; (3) tactical exercises on actual ground with imaginary forces—will, in my view, be now fit to handle troops in the field, provided he has concurrently mastered the science of drill. This latter position is obvious; and I only mention it to guard against being thought to be arguing in favor of a purely theoretical course of training. But although a man may have mastered two branches of a subject, each thoroughly by itself, it requires further time to be able to gain the power of uniting instinctively his divided knowledge.

I have now sketched the outlines of a course of practical training as nearly suited as I can imagine any course to be to the existing constitution of the volunteer force. But before proceeding further let me say that, although for the sake of clearness I have divided the course sharply into definite stages, in practice this sharp distinction is neither possible nor even desirable.

I have not the slightest inclination to minimize the difficulties which a very large number of volunteer officers find in giving the necessary time to military studies and exercises. Difficulties will, of course arise in the case of scattered battalions, from the fact that the study of text-books must, in most cases, be supplemented by direct teaching; and unfortunately the art of teaching, for examination purposes, is not a common gift. I would suggest, however, a partial remedy for this difficulty. Some, at any rate, of the district tactical societies have already organized classes for this purpose. These classes have proved to be of great value; indeed, have been conspicuously successful in cases where the officers live within reach of the district centres. But why should not their action be extended to coaching by correspondence? Such a method of teaching is already employed by other educational bodies in some subjects, and that of tactics is one in which personal demonstration is less important than it is in cases where this method is already adopted. I throw this out as a suggestion to tactical societies, for I think it may be a means of widely extending their field of usefulness. It is not easy for metropolitan volunteer officers to realize the sense of isolation in which the company officers of some country corps have to carry out their duties. What is needed is that they should be approached with a simple and economical scheme of instruction by correspondence. I am sure that there are hundreds of comparatively junior officers who would then gladly spend some of their winter evenings in such studies, if they felt confidence that they could thereby pass the examination successfully.

The second stage, that of war game on the map, presents less difficulty in the matter of time, but far greater difficulty in the matter of teachers. If an officer attends half a dozen war games during the winter months, and really pays attention while he attends, it is, in proportion, about as much as this stage of training requires. For it is worth noting that the spectators of Kriegsspiel gain nearly, if not quite, as much instruction as the players.

But practical considerations point to the necessity of decentralization, at least in the case of the minor war game. And this leads up immediately to a point on which I have always felt strongly—namely, that the true functions of tactical societies are, firstly, to train volunteer officers to be able to impart tactical instruction in their turn; and, secondly, to maintain a progressively high standing, both in the methods of teaching and in the substance of things taught.

Already in the metropolis, and in the large provincial towns, the work of tactical societies has borne fruit to an extent not generally fully realized. What is required is that this should be pressed further, and that country societies should aim at the same result. Whether this can best be done by the staff of the society moving from one headquarters to another, or by officers attending in some central town, or by modifications and combinations of these methods, must be left in each case for local convenience to determine.

All that has been said of the training of teachers for the minor war game applies fully in the case of the third stage of the tactical course—the stage of outdoor exercises with imaginary troops. A difficulty arises in finding suitable opportunities of imparting instruction. And to meet this difficulty I can contribute two practical suggestions. The first is the employment of Sunday afternoon walks (and, I might add, cycle rides) for tactical study. One often hears it remarked that the ordinary “constitutional” is dull without an object. Why, then, should not students of tactics convert their constitutional walks, not merely into reconnaissances of ground, but into seriously worked out tactical exercises? The second practical suggestion I have to make consists in the setting of tactical problems to be worked out on actual bits of country, the problems to be worked out when the student has leisure, and the solutions noted in writing, accompanied, if necessary, by rough sketches.

There remains, then, only the last and final stage of training, final at least as far as peace manœuvres can be final, the conduct of tactical exercises with actual troops. Such manœuvres on a large scale, under the command and supervision of regular officers of high rank and wide experience, take place at brigade camps, at Aldershot and elsewhere. And I am but echoing the feeling of all volunteer officers in expressing gratitude to those regular officers for the great labor expended in arranging and carrying out these manœuvres, and for the valuable remarks which succeed them. But there is a point at which the utility of these manœuvres stops, or rather the point at which they commence is too far advanced—and necessarily so. It but seldom happens on these occasions that a junior officer is left, as he perforce might be left in war, to make his own dispositions on his own responsibility. The causes of this are obvious. On the one hand, commanding officers succumb to the irresistible temptation (I speak humbly) of taking their juniors' work out of their hands. On the other hand, the scale of operations is too large for it to be possible for the umpires either to observe fully, or to criticise completely, the smaller units. I, therefore, advocate most strongly the encouragement, in addition, of course, to the larger manœuvres, of small affairs, a company against a company. I have a profound

belief that, granted a reasonable amount of knowledge, by far the most successful way of instilling into a young officer, not only further knowledge, but resource, and the habit of accepting responsibility, is to thrust that responsibility upon him. This can only be done by letting him rise to success, or sink to failure, by carrying out a small scheme against a real enemy in sole command from first to last.

The discussion was opened by Lord Wantage, who commended the lecture, but expressed regret that Colonel Balfour had not given the meeting a more lengthy description of what he described as the fourth stage of training—viz., manœuvres in the open with actual troops.

Lord Wolseley said: Before I proceed to make any remark whatever upon the various topics that have been brought so well and clearly before us, allow me to say with what pleasure it is that I find myself once more surrounded by the members of this institution. I have for five years been entirely absent from England, and though in Ireland we had a tactical society which did a great deal of good, it was on a comparatively small scale, and one could not expect it to be of the nature of this great and ancient institution. It is many years since I had the pleasure of being here, and I hope it may not by any means be the last opportunity I shall have of presiding at your meetings. Perhaps I ought also to say how gratifying it is to come back and find, where I left a ruin, the very fine building in which we meet now—a matter, I think, on which we cannot congratulate ourselves too much. Although there have been a good number of hard things said about the government authorities—I will not say whether justly or not—the government has, I think, met the members of our institution very well and fairly in affording us the means of establishing ourselves permanently in this hall. I feel great diffidence in speaking this evening, or in making any criticisms on the topics that have been brought forward, because I am here in two capacities. I cannot help remembering that I am here as an official, as commander-in-chief of the army, and I must be very guarded against saying anything which could imply that the military authorities are at all backward in their endeavors—certainly not in their wishes—to keep the volunteer force what I hope it will be, and I think is, on the high road to become a fully efficient force, capable of fulfilling the wants of the nation. I think that there was a slight confusion in the terms made use of in the course of the discussion, and once or twice in the remarks of the lecturer. It is a very common error, and will be appreciated by all those who have ever had to instruct young officers, not to draw the precise line between tactics and strategy. We have heard allusion made to “the science of tactics.” I think that is a misnomer. I think when you talk of strategy you talk of science, and that when you talk of tactics you talk of art; and it is very desirable to keep that distinction in mind when you discuss these topics. In regard to strategy, it is very desirable on the part of those who have to hold the high position of command, either as officers on the staff or otherwise, and who have to instruct others in military science generally, that they should have a very extended knowledge of strategy, and of military history, from which the rules of strategy, I may say, are derived. As

regards tactics, it is an art which, so far as I am able to speak with any authority, is very easily acquired. I think it was Sir Charles Napier who said that with ten men he was quite prepared to teach a great deal of tactics. He meant taking a small body of men along the road and teaching them certain fundamental principles of this art. I believe that any captain of a company can do so; and I go further. I believe, though great stress has been laid on the necessity for practice in tactics, that a very large amount of what is called tactical instruction can be learnt in the army. Given a blackboard and a good instructor, you may give to the ordinary mind of the British private, and still more to the mind of the private of the volunteers, a considerable amount of knowledge in reference to tactical forms, and of what he ought to do in the presence of an enemy. The various duties in regard to patrols, outposts, rear guards, and advance guards can to a large extent be taught in a room. In other words, a great deal can be taught in this way without any practice, I may say, out of doors at all. Of course, I do not wish for a moment to deprecate the instruction that is given in the field. On the contrary, I think the more that officers of the army and the volunteers can go into camp and be taught tactical operations on the ground, the better it will be for them. One of the speakers, I think, said that officers of a regiment are generally what the commanding officer makes them. I believe that to be most fully the case, and, further, that the men are what the captain of a company makes them. If the captains of companies have studied the subjects properly, they can and they ought to be the best means of teaching those under their command. If you find men face the wrong way in outpost duty, it is generally the fault of the captain that these men exemplify how little they know of the rudiments of their trade. When I remember what volunteers were, and see what they are at the present moment, I cannot help congratulating them upon all that they have done in recent years to improve themselves. We all know that at first they had very little discipline and very little drill, and now I think they have improved on both these points. And when I refer to drill, may I plead a little bit in its favor? I think it has been kept rather in the background this evening; because, after all, tactical forms and operations depend very much upon drill. There is, perhaps, no man who has worked harder than I to reduce the old-fashioned drill to what it is at the present moment—to get rid of obsolete and complicated forms and intricate manœuvres. Still, I have never for a moment depreciated the value of knowledge of drill, and I think it is a point to which volunteers might, certainly in the country parts of England, turn their attention a little more than they have done. The lecturer spoke of the people who said the volunteers wish to run before they could walk. I think we ought to learn to walk well before we attempt to run. And in order to be able to run well you will have to learn drill—that is not only the process for moving men in forms and large bodies, but also the mode of imparting to volunteers what I referred to as discipline. Drill not only disciplines a body of men, but it teaches them what is perhaps the greatest and most essential element in the rudiments of their calling—obedience. I do not think you can teach that to a body of men better than by the process of drill. I have often, looking out

from my room, watched officers drilling a squad, and the language used was perhaps not always of the most elegant description, but it was very effectual, and addressed to men who thoroughly understood it, and the very chaff of the drill sergeant had a great effect on the men. The instruction imparted to these men by the drill sergeant in teaching them the goose-step carried with it a far greater value than might appear on the surface. I cannot help thinking, therefore, that, although knowledge of tactics is of the very greatest consequence, knowledge of drill ought not to be neglected. We have had some very admirable recommendations made to us as to the mode in which tactical knowledge could be most easily and effectually imparted to the officers of the volunteer service. The lecturer has told us it must not be compulsory, whilst one of the speakers who took part in the discussion told us it was necessary that it should be compulsory, believing that unless it was so it would never be effective. There is a great deal to be said in favor of making it compulsory, but we have to deal with actual facts, and cannot lay down in writing what we conceive would be the best possible process for imparting this tactical knowledge, which we are anxious that the volunteer officer should learn. We must take the volunteer force as we find it, and a most magnificent force it is, according to my view. We must, above all, not do anything to injure the I will not say instinct, but the patriotic feeling which originally called it into existence. We must remember what it is composed of, both in regard to men and officers, who receive no pay, and as practical men, if we cannot get the whole loaf we must be content to take the half of it. If we cannot have our gate of iron, we must take a wooden one. That is the way we must look at the volunteer force; we must facilitate, in the best way we can, the acquisition of tactical knowledge by the officers of that force. We have not come to that period when we can lay down dictatorially to a volunteer officer, "If you do not pass certain examinations in tactics we shall dispense with your services." On the other hand, I believe that, whenever we get a bad commanding officer, I think we should do with the volunteers what I hope will always be done with the line—that we should get rid of him. I believe that when an officer has shown a great want of tactical knowledge, and it appears that those under his command are not being properly instructed, the first thing to be done is to change the bowler—change the leader—change the commanding officer, and say to him, "You have done your best, sir, but your best is not good enough for us, and you must go." I can only further say, as I have to fulfil another engagement, that no man in England has a greater admiration than I have for the volunteer force. I have always fought the battle of the volunteers, and you may rest assured that anything I can do towards improving the efficiency of the force will, to the best of my ability, be done.



## MUSKETRY IN INDIA.

*(From the Army and Navy Gazette.)*

WE have received from India the annual report on musketry instruction, signed for the first time by Lieutenant-Colonel W. Hill, Assistant-Adjutant-General for musketry. The Indian musketry report always possesses a special interest, for in India the numerous opportunities of conducting musketry training practically have of late years been taken advantage of to the fullest extent. Sir George White in issuing the report notifies "much interest is taken in this important subject throughout India, and there has been considerable improvement in the shooting and in the musketry efficiency generally of all ranks. His Excellency considers that the results are satisfactory and creditable to all concerned." The number of men exercised was: British cavalry, 3379; infantry, 27,272. Native troops: cavalry, 13,889; sappers and miners, 881; infantry, 53,298. The best shooting British cavalry regiment was the 16th Lancers, the best infantry regiment was the 1st Battalion Devonshire regiment; the best native cavalry regiment was the 6th Bengal Cavalry, the best infantry regiment was the 26th Punjab Infantry.

Colonel Hill states that there has been a marked improvement in the efficiency of both officers and non-commissioned officers as instructors. They have learnt, we are told, to "realize the necessity for extreme accuracy in the words of command, and the preliminary drills are now conducted much more regularly than was the case a few years back." But we are sorry to say that Colonel Hill does not find it possible to speak highly in praise of that fire discipline and control without which infantry in these days loses half its value. On the range there is nothing much to find fault with. There "the collective fire is excellent," the report says, "and results in a well-directed and well-controlled fire being delivered on the objective." When, however, the men are taken on to new grounds, where the distances are unknown, a different state of things presents itself, for, to use Colonel Hill's language, "off the rifle range, at drill and manœuvre, fire discipline and control exist only in name." And Colonel Hill supports his statement by hard facts. His remarks on drill as applied to tactics are as applicable to the home army as to that over which he presides in musketry authority. We therefore give them *in extenso*, for the benefit of all who are engaged in the sometimes trying duty of teaching the young British soldier how to shoot:—

"It has hitherto been but partially recognized that practice in the combination of drill with fire tactics is the logical outcome of the soldier's individual training; that the rifle range and adjutant's parade belong only to the rudiments of that training; and that musketry can never make any reasonable progress until it has been quite accepted that the true musketry training of the army begins only after the individual soldier has joined the ranks well drilled, smart in the handling of arms, a good shot, and with some knowledge of collective firing. The importance attached to drill and discipline in continental armies will be gathered from the following quota-

tion from the criticisms of a very keen observer: 'As did the battalions of Frederick the Great, the German infantry of to-day may come to owe much to the perfection of their close-order drill. The formations of the parade ground may never be employed in action, but they are undoubtedly the best school for discipline.' It is on this discipline that musketry depends. It is a most serious mistake to imagine that musketry can be safely associated with slack or inaccurate drill, and relaxed discipline; indeed, the contrary is the truth, and the moment fire is opened the bond of strict discipline should be, if anything, drawn tighter than ever. The drill books explain the shortest methods of moving troops from one position to another, and they also lay down the fewest words of command for those movements. As a rule these words of command are given with an exactitude that leaves little to be desired, but when firing is commenced the executive words are often incorrect, and not infrequently unauthorized words are interpolated. It cannot be too frequently impressed on all ranks that the evolutions of infantry in action are but a means to an end, and that end is the most effective use of the rifle. This is the true theory of fire tactics. The manoeuvres of a battalion are but the preparation which, while undoubtedly calling for smartness and high discipline, do not necessarily require that finish without which the highest fire effect is unattainable. It follows that extreme accuracy of command is much more necessary during the period when the rifle is in actual use than in the preliminary movements which are intended to give it its most favorable opportunity. When the crisis has arrived for the delivery of fire men's nerves are at their highest state of tension, and any inaccuracy or mistiming in the word of command may produce the most injurious results."

The best test of aimed fire, Colonel Hill contends, is to time volleys with a stop-watch and see in how many seconds the rifles are discharged after the word of command is given. He subjected seventy regiments to this test last winter, and the conclusion he arrived at was that "whether at short ranges standing, at medium ranges kneeling, or at long ranges up to 2500 yards lying down, with or without blank ammunition, ninety per cent. of the volleys were quite unaimed." It is quite true that the volleys, as he tells us, were delivered with extreme accuracy so far as the simultaneous discharge of the rifles was concerned, but the time allowed between the "present" and the "fire" was so short as to render aimed fire impossible. At 2000 yards three seconds only were allowed between the two words. As is pointed out, in such a flash of time no aim could possibly be taken through the aperture sight—an old rifle shot firing individually would take at least twenty seconds to get a proper aim. But the majority of the soldiers who were being dealt with in these instances were not practised shots at all, only young beginners acquiring a rudimentary knowledge of the art, if we may call it so. It may interest officers and non-commissioned officers of the home army to learn that Colonel Hill suggests that if the minimum time allowed between the "present" and the "fire" were taken as four seconds standing, six seconds kneeling, and eight seconds lying down, a margin would be left for possibly more hurried yet effective firing on service.

Colonel Hill speaks in high terms of the regimental rifle clubs which are being started by many regiments in India. "The maintenance of a good rifle club in a regiment," it is said, "is a very important factor in our musketry system. Through its influence men become exceptionally expert in the handling of their arms; it affords them congenial occupation during many hours and days throughout the year; it gives a man more confidence in himself and his rifle, and ensures far greater care being taken of the weapon than would otherwise be the case." It is a known fact that rifles are always found in better order in a good shooting regiment than in those lower down the figure of merit list; and in Colonel Hill's words, "apart from the question whether individual marksmanship is in itself a complete training for service, there can be little doubt as to the advantages which accrue from rifle clubs to the soldier, to his regiment, and to the State."

Night-firing in defense of a position is always interesting, and the present report shows that it can be effectively carried out if distances are marked off beforehand and rests used. At Lucknow a position was taken up which might have to be held in actual warfare. The "general idea" was that a force retreating on the city had to leave a strong rear guard of infantry with four guns and one machine gun to hold the enemy in check at the Garumbah nullah. The "special idea" was that the commander of the rear guard was to hold his position as long as possible, so as to give time for the main body to cross the Gumti; he had to intrench himself and repel an attack in force during the night. The operations were made as realistic as possible. A portion of the infantry were placed in position with rifles fixed on rests with sights adjusted for one party at 800 yards and for another at 600. The alarm was sounded; the enemy were reported to be crossing the nullah by the ford and advancing by the main road. Fire was opened from the rests and from the Maxim. Then star shell were fired, and screens were seen representing an attacking force in four small columns moving against the right face of the position. The third stage was an attack first on the right, then on the left, then against both at once. To render this more striking, men were placed in pits, their duties being to raise targets and throw out bombs. The object was to ascertain the extent of ground raked by fire rather than the number of hits obtainable on upright targets, and the area fired at was marked off into rectangles of varying depth and front. On the right face the infantry secured a percentage of 8.45 hits to rounds fired; on the left 10.18. The Maxim was found unsuited for black powder and it only fired 105 rounds, but with these fifty-three hits were secured. The elevation throughout was too high, and this is noted for future guidance—an elevation considerably less than that required for the actual distance should be taken. On one side of the position black powder was used; on the other cordite; in the latter case a clear field of view was obtainable throughout, thus proving the superiority of smokeless powder. The fire discipline and control were reported on as excellent, the signals by whistle being promptly obeyed. The operations had been rehearsed with blank ammunition, and this contributed very much to the success gained. The percentage of hits from rifle fire was distinctly good,

while the Maxim showed how useful a weapon it is in defense. From first to last the report is most interesting and valuable.

Lieut.-Col. Hill, makes some general observations on the attack, which cannot fail to interest officers on home service. We therefore reproduce them *in extenso* :—

“ It is noticed that the system of attack as practised at field firing is practically the same in nearly all stations, and that apparently the principles laid down in the ‘ Infantry Drill ’ of 1893 are not fully appreciated. The attack on the position, which should be more or less general up to 500 yards from the place, has not been sufficiently differentiated from the assault, which should be local. Judging from the reports and sketches, the first line rarely exceeded in length the front of the position attacked, and the final assault was delivered by the whole line simultaneously. In no instance was the first line used ‘ to envelop the front of the enemy’s position—and when about 500 yards from the position endeavor to establish itself in good defensive positions all along the front, whence as from a first parallel in a siege both false and real attacks can be made on the position in front,’ contemplates the occasion arising when it may be necessary to reinforce that particular portion of the first line opposite to that part of the enemy’s position upon which the officer commanding means to direct his main attack from reserves on either or both flanks—possibly from another regiment or brigade. Even in spite of such reinforcements, it may be found that the first line cannot advance, and that it is necessary to deliver the assault with the second line using only the bayonet. ‘ The Drill Book ’ does not contemplate the second line firing, but that it should steadily and continuously advance and if necessary deliver the assault with the bayonet. It is contrary, therefore, to the principles laid down for the attack for the second line to be halted at short range from the position and to open independent firing immediately before delivering the assault. The second line should neither halt nor fire. ‘ The initiative (for the final assault) may come from the firing line,’ and this might be preceded by a heavy independent fire; but if this firing is prolonged, the initiative for the assault would probably not come from this firing line, but have to be left to the second line. Paragraph 115, Part V., page 101, ‘ Infantry Drill,’ explains the special duties of the officer commanding the second line, immediately preceding the assault, and the concluding portion of that paragraph requires very careful attention: ‘ Hence the vital importance of skilful leading—of having the troops for the assault at hand at the exact moment, without previous unnecessary exposure to fire. If handled with skill, it should be possible to lead the second line through decisive ranges in an uninterrupted advance to the point of assault.’ The rôle of the first line (the enveloping line), well established in a defensive position within about 500 yards from the enemy’s position, might be to concentrate its fire on the point of assault and to be prepared to meet any counter attack from the most advantageous positions for defense that it has been able to take up, and with the additional superiority that formed troops halted and under perfect command and fire control undoubtedly possess. For the purposes of a musketry practice, the attack on a position such as is contemplated in ‘ The Drill Book ’ necessitates the prac-

tice being repeated; the troops employed in the first line in the first attack forming the second line when the practice is repeated. In this manner field firing might be made more instructive as a field manoeuvre than at present in addition to being a musketry practice. It should be borne in mind that no musketry field practice should be conducted in a manner that violates the principles laid down in 'The Drill Book,' though the object in forbidding a standard form of attack is to inculcate the widest latitude being allowed to commanders to vary their formation and movements as the circumstances of the moment and of each situation may require.

"It is also observed that arrangements are but rarely made to accustom troops to act on the defensive in field-firing practices, though when such operations have been carried out in accordance with the principles laid down in Part V., Sections 117 to 121 and 128 of 'Infantry Drill,' they have proved both interesting and instructive.

"The difficulties of arranging for such defensive practices are no doubt considerable, and may have deterred general officers commanding from considering schemes of defense as often as those of the attack. Owing to the greater number of dummies required the expense involved would necessarily be greater; and, secondly, considerations of safety occasionally do not admit of the diverging fire from a defensive position. But these difficulties do not exist at all stations, and, provided suitable ground is available, general officers commanding districts may often be able to sanction the expense of a well-considered defensive scheme for field-firing submitted to them for approval. The annual field-firing practices afford an opportunity to infantry to become better acquainted with the tactics and fire effect of artillery, and wherever practicable field-firing should be carried out on as extended a scale as possible. It is laid down in paragraphs 4 and 5, Section 113, 'Infantry Drill': 'As a rule no attempt should be made to advance before the artillery of the attack has gained a superiority over that of the defense. In peace manoeuvres the preparation by artillery fire is frequently so curtailed as to give a false impression of this important phase of an engagement.'

"In the event of artillery opening fire between ranges of 2500 and 2000 yards, when circumstances are favorable to the attack and other conditions fairly equal, it is calculated that at least half an hour would elapse before the artillery can obtain the superiority over that of the enemy which will enable the infantry to advance; at ranges between 2000 and 1200 yards under similar conditions, the artillery could perhaps establish the requisite superiority in 20 minutes. The rate of fire should therefore be regulated so as to cover the period determined on. The amount of ammunition per gun being small, it will probably not be considered advisable to open fire at longer ranges than 2500 yards. Section 114, paragraph 1, 'Infantry Drill,' states: 'It may be advisable to advance the artillery to closer ranges whence it will at all hazards and regardless of losses support the infantry advance.' Even if it should not be advisable or possible for the artillery to fire at the close ranges, they should be ordered to take up positions and remain in action so as to show the infantry where they would be when the hottest part of the engagement might be expected. No consideration of cover should under the circumstance be allowed to weigh against the one

paramount duty of affording the fullest support to the infantry. The commander of the attack should inform the officer commanding the artillery of the plan of attack and the task he wishes the artillery to accomplish. There is sometimes a tendency on the part of officers commanding an attack, if infantry officers, to request the artillery commander to afford a general support to the infantry, and to take no further part in the conduct of the artillery tactics. Such abdication of the powers vested in a commander should not be permitted. If in a general action the commander were to allow the officer commanding the artillery to make his own dispositions, the officer commanding the attack might at the supreme moment discover that the artillery were being manœuvred to an end which did not accord with his own scheme."

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### EXPANSION OF THE ROYAL MARINE.

*(The Army and Navy Gazette.)*

THE recent political developments have, or ought to have, prepared the British public for some startling figures in the naval war budget. Few, we believe, will be found to question the government unkindly on the subject, and we dare to hope that even the Little Englander of the most advanced type will strive in vain for an effective following when this—to Britons—most important document is laid upon the table. Not that so far as ships are concerned we anticipate the advent of some markedly different type of battle-ship, cruiser, or gunboat; and even in that case the general public are, as a rule, content to accept the dicta of the experts employed by the Admiralty to prepare the shipbuilding designs. The torpedo flotilla, too, will doubtless be yet further increased in number, and the competition with our friends across the Channel will, it is to be hoped, in this respect terminate in a bloodless victory of numerical superiority. The tactical exercises of those entrusted with the navigation of these sleuthhounds of the sea will unquestionably be further perfected, and the inlets and outlets of our indented coast should soon be thoroughly familiar to the commanders of our torpedo craft. Naval men will look forward also to such an increase of officers, blue-jackets, and stokers as shall render all our ships in the dockyard reserves available for immediate mobilization.

Behind these matters, important as they are, is a question involving the future of the Royal Marines. Naval officers of the highest rank and competence are averse to any system which shall remove the corps from naval administration. It follows, therefore, that the establishment of the Royal Marines should keep pace with the increase of the navy. The admiral of to-day is more like the Korniloff of Crimean fame than ever he was before; he is charged on distant stations with military functions as well as naval command, which are in abeyance until the moment is at hand when diplomacy having failed, the fleet has to take the initiative. Now, naval commanders-in-chief are traditionally averse to interference from or intricate negotiations with commanders of the land forces, and have a natural liking



for supreme control over all operations entrusted to them. Thus many cases may arise where the naval commander-in-chief would find it more than convenient to have at hand on a foreign station depots of seamen and marines supernumerary to the actual ship's companies, and mobilized for immediate despatch to any part of the station. The present establishment of the Royal Marine forces is inadequate for such an expansion of our naval commands-in-chief. It is with difficulty that the marine divisions carry on the duties of training their units for the multifarious rôle of the "sea soldier." Men in numerical sufficiency are required to train men, and setting aside the proposal of foreign depots of the corps, the marines of 1896 are below their tactical strength. Again, the peculiar conditions of service in the Royal Marines make it advisable to encourage close contact with the army and careful attention to the all-round military training for service in all parts of the world, to which it is our proud boast that our soldiers of the Line attain. The officer and man, then, of the Royal Marines should be accustomed to all kinds of soldiering by land and sea, and must be a good gunner if he is to serve with credit in the batteries of the fleet. It may not be considered incompatible with his rôle as a sea soldier to suggest the advantage of regularly attaching officers and non-commissioned officers of the corps to auxiliary artillery units and Volunteer infantry detailed for service on the coast-line. The time, too, seems to be at hand when this particolored corps will finally adopt one uniform, and that an artillerist's, but with it the combined training of both artillery and infantry. Many of the Volunteer corps, too, undoubtedly should be to all intents and purposes marine troops, more particularly those trained as artillery, submarine miners, and infantry stationed on the littoral. These should be available at need for naval defenses and liable to the rule of naval and marine officers.

Thus the tendency of increased naval estimates, it may be anticipated will be in the direction of bringing into closer touch with the navy all units charged with the defense of preëminently naval ports. Coast-defense vessels might well be manned by artillery volunteers, and the submarine miners at naval ports might be affiliated to and trained by naval and marine officers, educated as are the Royal Marine Artillery of to-day with the addition of the submarine mining course now in vogue in the Royal Engineers. Finally, it is impossible to avoid the conclusion that, careful as is the attention of the Admiralty to naval questions, the tendency of the nation at large, as evinced by the growing popularity of the Volunteer force, is to militarize in the narrowest sense of the term, while neglecting the fact that the object of all coast defenses and their personnel is far more to keep the enemy at sea than to meet him with a field army and perhaps defeat him at Dorking, Guildford, or elsewhere. Thus, if we regard the proportion of infantry composing the Volunteer rifle corps, we find rather a series of field columns than soldiers trained to hold intact the sea boundaries of our islands, and to keep quiescent and regular the pulse of London and the arteries of that great heart of British commerce. We constantly hear our navy described as fundamentally a line—more recently *the* line—of defense, and there is a growing disposition to regard our army as, more or

less, a weapon of offense. To be true to this legend, we should discourage the increase of any military units of Volunteers, except those who will enrol for foreign service or for work as marines in the coast-defense organization and in the harbor works.

## COAST ARTILLERY IN ACTION.

By LIEUT. COLONEL J. R. J. JOCELYN, R. A.

(A lecture delivered at the Royal Artillery Institution, Woolwich, 8th November, 1894.)

I PROPOSE this afternoon to draw attention to certain technical details connected with the efficient working of the guns of the coast artillery, but without any special reference to the particular service those guns may be called upon to perform; for this, I consider, to be less a question of training, than of distribution of matériel and personnel, which, is, rightly, in the hands of superior authorities, who are able to regard it, not only from an artillery, but also from a naval and engineer standpoint; and, in discussing training and command, we may, I think, very well leave such questions alone. Nor do I propose to touch on the vexed question of ships *versus* forts, or on what a gallant enemy dare or dare not do. Considering the small data we have before us, in view of modern progress, it will be wiser to observe the aphorism, "Do not prophesy unless you know."

### TRAINING: AN ABSTRACT QUESTION.

It is our duty to train the coast artillery, so that it may be ready for whatever it may be called upon to do; to make it into a machine, which will work together harmoniously, in all its parts, with as little friction as possible, and with no portion of it subjected to undue strain; and whether its lot may be, to check the raids of torpedo-boats, or fight fleet actions, I cannot see that its training can be affected thereby. No one knows what the future may bring us, therefore let us seek to make it resemble one of those steam hammers close by, which can forge the breech-piece of a "Woolwich Infant," or crack a nut, if necessary, and until the day of trial comes, bringing with it what it may, let us so work, that we may then hope to justify the money and thought that has been expended on it. Training of necessity, must be an abstract question.

### THE CHAIN OF COMMAND.

I propose first dealing with the new chain of command which has been laid down by authority. It is familiar no doubt to most of you, but in order to clear the ground, I will read two short extracts from official documents:—"A fortress section will be organized for artillery purposes in one or more fire commands, of which the size will be governed by the character of the water areas to be defended, and by the number of forts and batteries which it may be possible for one officer to direct in action: under certain circumstances, it may be desirable to place a Section C.R.A. in command of several fire commands; but as a general rule, this officer will not be required, and the section commander will then communicate directly with

the fire commanders. In this, as in all other questions connected with command, the utmost latitude must be allowed to stations. The next link in the chain of command will be the battery commander. His unit of command will be decided by local conditions, being governed by the positions of the guns and by the water areas to be defended; but it should in no case exceed the number of guns, which can, under local conditions, be efficiently supervised by one officer. Under the battery commander will be a certain number of officers, or selected N.-C.O.'s, who will have charge of the gun groups. They are styled gun group commanders. The gun groups having been settled, with due regard to their efficient supervision by their commanders, they should be collected into battery commands, which should be arranged with respect to the sea areas to be defended, and also to the siting of the gun groups, all of which should either be visible from, or in direct communication with, the battery commanders 'command post'; the latter being a place selected in the vicinity of the most important group, whither all orders from the fire commander will be sent. When a gun has to be fought singly, the gun captain will perform the duties of gun group commander. When a gun group is so far detached from other gun groups that it cannot be conveniently included in any battery command, the gun group commander must be prepared to execute the duties of the battery commander, in addition to his own, and no battery commander will be appointed." "The fire command will include such battery commands and detached gun groups as can be worked in combination for a definite tactical object; when a battery command is, owing to special circumstances, of such a character that it cannot be allotted to any fire command, the battery commander must be prepared to discharge the duties of fire commander as well as his own, the communications running direct from him to the section commander."

#### FLEXIBILITY.

In the above, the first point I would ask you to notice is the extreme flexibility—the extreme latitude that is allowed to local authorities, who should be in a position to judge how best to carry out the orders laid down. We must have flexibility of procedure in the garrison artillery; we are of all arms in the service the most tied down; we fight, as it were, in a strait-waistcoat; we work our guns where they happen to be, not always where we should like to put them. This, of course, cannot be helped; the best intellect of the time is given to choosing sites and designing fortifications; but, unfortunately, permanent works cannot always be altered so as to accommodate themselves to every change in arms or ideas, so we must accept matters as they are and make the best of them. Thus it is, that great flexibility must be permissible. We must observe principles, for if we do not, confusion will result, but the utmost latitude in carrying out details is not only permitted but encouraged by the present orders, which are designed to put the garrison artillery on a tactical footing, to knit officers and men together, as in the other arms, and to make it a fighting force, rather than a concourse of scientific individuals, engaged in target practice. Therefore our drill-books must be looked upon as sticks and not as crutches, we must not hang on to them nor shirk responsibility when circumstances

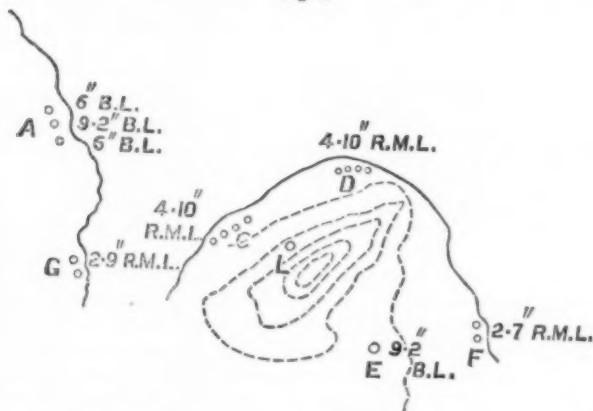
arise which prevent the carrying out of the strict letter of the law : we can always be pulled up if we have done wrong, we can always remember we have done our best. It is now time to walk boldly forward, not like children learning to toddle ; perhaps a little hesitation might have been justified when electricity first came in, being such a mysterious force to all of us, nor can we altogether blame those who looked upon the position-finder, on its first appearance, with something of that consternation, with which the Mexicans, who had never seen a horse, regarded the mounted followers of Cortez ; but now as we have become accustomed to these things, they should be treated neither with misgiving nor idolatry, but be recognized, while always servants, as our most faithful and useful friends.

#### SUPERIOR KNOWLEDGE REQUIRED BY EACH RANK.

The next point to notice is the superior knowledge which must be demanded from each rank : thus it is laid down that gun group commanders must, under certain circumstances, exercise the functions of battery commanders, battery commanders, those of fire commanders, and so on. Those who have any experience of the manning of coast artillery, know that it has long been recognized that the gun captains must be looked to very often, to take charge of groups ; this is now absolutely recognized ; the new orders do not blink the facts ; but it will sometimes happen that we must go further, and allow gun captains to exercise certain duties, which up to the present have been among the functions of battery commanders. An example will show what I mean.

The battery A, Fig. 1, is not a very uncommon arrangement ; there a

Fig. 1.



9.2" B.L. gun is placed between two 6" B.L., thus making 3 groups, with a single gun in each, the drawbacks of which I need not point out ; it will probably be impossible to assign an officer to each gun, and the gun captains of the two 6" will have to take charge of them ; also, it is more than likely that the centre gun alone will be provided with a position-finder,

which at most can give an uncorrected range to the lighter guns. The ranging of these guns will have to be carried out by the gun captains, I see no other way out of it.

Then, as we know, a gun group commander, when in an isolated position, must naturally take up the duties of battery commander; this would be the case at *G*, Fig. 1, when the officer in charge of the two 9" R. M. L. would have to be in direct communication with the fire commander.

Now if we consider the whole armament shown in Fig. 1, we see that it must be divided into two fire commands; the guns at *A*, *G*, *C* and *D*, all bear more or less on the same water-way, and can be handled for tactical purposes by a fire commander at *L*. Were it not for the rising ground close to this station, he could also include in his command the three guns at *E* and *F*, which we may consider as some three or four hundred yards distant. But the configuration of the ground removes them completely from his control, as far as action is concerned. These three guns would form a battery command, and the battery commander would have, in addition to his duties as such, to exercise fire control as well. He would probably station himself at *E*, where his most important gun is; it, no doubt, would have a position-finder, but the two 7" R. M. L. would probably be fought by depression range-finder, and their gun group commander would have to range them. At *C* and *D* are two normal battery, and four normal group commands. It is evident that each rank must at times be prepared to assume higher duties.

#### LOCAL MODIFICATIONS OF THE ABOVE.

At the same time it will sometimes be possible, and, in my opinion desirable, for an officer to carry out a certain surveillance over portions of his natural command, which, by force of circumstances, have to act separately when fire opens. Thus, though the fire commander at *L* cannot see the guns at *E* and *F*, nor how they are firing, he can very well carry out all the other duties of his rank, with regard to them; as they are close at hand, he can inspect them, see that communications and range-finding installations are in working order, for I think he should do this by personal inspection, he can concert with the battery commander how he is to act, under certain eventualities, and carry out all his ordinary duties connected with ammunition supply, reliefs, etc.

Then, again, the battery commander at *E*, though perhaps he cannot actually range the guns at *F*, is quite near enough to overlook how they are being worked. The gun group commander at *F* is thus in a different position from the one at *G*, who is isolated, and must in all respects fulfil the duties of a battery commander.

At *A* also, if there are one or two officers available as gun group commanders for the three guns, it is quite possible to carry on a certain surveillance over the gun captain or captains, who are acting independently. Minutes, such as these, cannot be included in a drill-book; it is for the common sense of the local authorities to organize their personnel to the best advantage.

With the exception of these considerations, I do not think the gun group commanders and gun captains are much affected by the new orders:

their duties remain much as they were: the functions of the battery commander have, however, been more closely defined, and as his command is perhaps the most important thing in coast defense, it is worthy of special study.

#### THE BATTERY COMMANDER.

A battery command is now defined, as the number of guns which can be effectually supervised by one man; it is thus a true tactical unit, and its method of fighting depends upon two things, the range-finding installation and the class of work the guns are placed in.

#### RANGE-FINDERS.

With regard to range-finders, I yield to no one in enthusiastic admiration of those we have got; the reputation of the position-finder has been damaged, more by injudicious praise than by anything else, more by those who imagined it would work miracles, than by those who knew the true limits of its powers. When used as a range-finder, that is, when the gun is laid over the sights, it is hard to imagine a more complete and useful instrument, added to which, it has a unique value when gun-sights are obscured or guns mounted for high-angle fire. To it also we owe the fact, that the guns of a fortress are now knit together and combined, in a way that was never dreamed of before, for I believe Colonel Watkin was the first to propose and carry out electric communications. It is possible, but not probable, that we may live to see better instruments and better systems, but the first step was taken by Colonel Watkin, and nothing can rob him of that glory. From the introduction of electric communication dates the renaissance of the garrison artillery.

The depression range-finder is, I think, a favorite with everyone, and I have just heard that Colonel Watkin has further improved it; he has replaced the slider by a wheel, given a larger arc at the base and a more powerful telescope, and has, in fact, turned out a stronger and a better instrument; but excellent and handy as the depression range-finder undoubtedly is, I need not tell you it cannot do all that the position-finder can. The latter will, I believe, be given to all the more important groups, while the former will be supplied at present, at the rate of one a work. It is, of course, obvious that the nature of this supply intimately affects the method of fighting a battery command. Not less in its influence, is the nature of the work, in which the guns are placed.

With regard to the battery commander, I wish to draw attention to the three following points:—The targets he can engage, his position in action, the responsibility of correcting fire.

#### TARGETS.

The number of targets that can be engaged simultaneously, will depend on the range-finding installation; if a depression range-finder is employed, only one target can be dealt with, whereas, if there is a position-finder per group, each group can fire on a separate one. For my own part, I am somewhat afraid that this idea of engaging several targets at a time by one battery command is liable to be pushed too far: we must remember that if we want to lay guns over the sights, we must have a clear view, and this, prac-



tically, independent group firing, may lead to great interference from smoke, especially in casemates. Seeing that a battery command does not comprise any great number of guns, I should almost prefer to deal with one target first, and then get on to another: for it is more important to absolutely crush one objective than to partially damage two. I do not mean to say that two targets at a time should never be engaged, but when it is necessary, the question of smoke must not be lost sight of, and groups controlled accordingly.

The next two points had better be considered, first in an open fort and then in casemates.

#### POSITION OF BATTERY COMMANDER IN ACTION IN AN OPEN FORT.

In a fort of any command, it should be an easy thing to establish the command post in close vicinity to the guns, and also in a place, whence the water-way would be visible, a depression range-finding pedestal being also close at hand; for it would be well to always provide this instrument. On a low site, this might not be so feasible. However this may be, once action is imminent, the battery commander would select a position from which he could see his water-way, leaving a representative at his command post, if the same were not quite close at hand, in reach of his voice. Such a position is an absolute necessity, with one exception. Naval officers tell us that the best way to silence a fort is to come in close and overwhelm it with fire granting that the ships have come in close, then the time for range-finding has passed by, guns would have to be laid by aid of the sights alone, and fired as quickly as possible, and the battery commander would be with his men, beside them, close in touch with them, encouraging them in their work and sharing their risks. On the whole, the question of the battery commander's position in an open fort is a fairly simple one.

#### CORRECTION OF FIRE IN AN OPEN FORT.

Next we have the question, by whom shall corrections be applied to the range, as found by the instrument? Now, when the position-finder is employed I believe this matter can be left to the observers, but even then, the battery commander should have the last word. But with the depression range-finder this is impossible: the observer is fully taken up, keeping his instrument on the target, and if the drum-reader calls out its indications correctly, it is as much as we can ask of him. In this case, I think, the battery commander must take charge of the corrections, and, if he has to leave the vicinity of the instrument, he must employ someone else to do it for him. As a rule, I think the method of fighting an open work is easily determined.

#### THE FOREGOING QUESTIONS IN CASEMATES.

In casemates, however, in considering the two foregoing questions, we are face to face with certain difficulties. A battery commander can never be in touch with his men to the same extent, as in an open work, and a position on the roof of the fort is almost forced upon him; for, were he even on the actual gun-floor, he could see, at most, two or three detachments at a time. We must rest content with placing him where he can see his water-way, and at the same time be in easy reach of any place,

where circumstances might demand his presence. This difficulty is emphasized, when we have two tiers to deal with, especially if the fort is one, which must be divided into two battery commands, which division should be vertical and not horizontal. The latter arrangement is necessitated by the consideration that, the smoke of one group should not interfere with the laying of another. Rigid control of the group fire will have to be carried out, and rapidity be sacrificed to the necessity of a clear field of view.

While the normal method of correcting fire must be the same as in an open fort, there will be great difficulty in carrying it out, and the position-finder will lose a good deal of its special advantages when placed on the roof, a position which cannot always be avoided. When opportunity arises, battery salvos should be employed.

Cases also will be found, where normal methods altogether fail and special arrangements have to be made, such as firing at fixed points or fixed trainings, average ranges to the fairway being taken. These arrangements must be worked out locally, to suit the special difficulties of the case.

#### THE FIRE COMMANDER.

With regard to fire commanders, I would lay stress on their getting a good hold of their commands, on their regarding it as a tactical body, for whose training for action and general readiness for any emergency, they are directly responsible. The important duties of organization and preparation are in their hands and should be thoroughly appreciated by them. The limits of their command depend on local circumstances entirely, and the wording of the order should be carefully considered in each case, namely, "the size of a fire command will be governed by the character of the water areas to be defended, and by the number of forts and batteries which it may be possible for one officer to direct in action." The control they can hope to exercise in action, will, also, depend on locality, and its possible limits should be determined, as far as possible, experimentally. It is a matter that we do not know much about, and certainly wants working out.

#### SECTION C. R. A.

The Section C. R. A. will, "as a general rule, not be required," the necessity for one would depend, not on the number of the fire commands, but on their distribution, the water-ways commanded, and the possibility of concentration of fire.

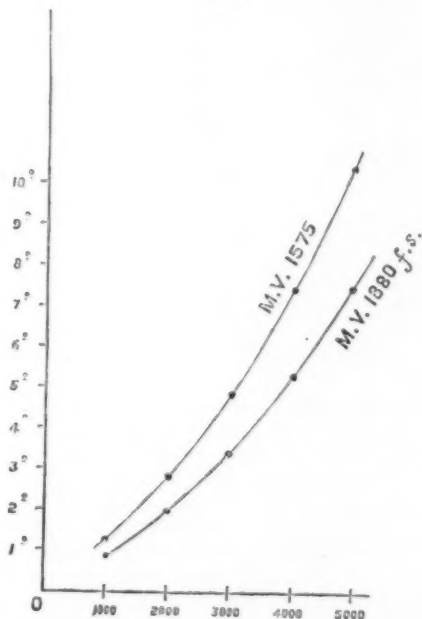
#### RANGE CORRECTION.

I now wish to draw attention to certain points that require either elaborating or working out. The first of these is the "corrections for range." We are accustomed to consider this, as depending on the three factors—powder, tide and travel of target. Under the heading powder we class the united effects of variation in powder, bad drill, temperature, atmospheric conditions, age of gun, and "personal factor" of gun, a formidable array enough. If, however, we assume that the powder is good, and eliminate such preventable disturbing causes as bad ramming home, damp sponging, etc., we have what is called the "error of the day" left, which of course,

in any particular gun, will have a certain effect on the muzzle velocity. It is useful to consider this effect by itself; and here, let me say, that I know it is impossible to consider these effects separately in actual action, but, as it is not feasible, as I shall attempt to show, to correct fire properly "shot by shot," it is proper that we should think out, before action, how the various disturbing causes affect the shooting, try to eliminate them as far as we can, and where this is impossible, to leave as little as may be to individual judgment in war time.

In Figs. 2 and 3 I have drawn the curves of range and elevation in the

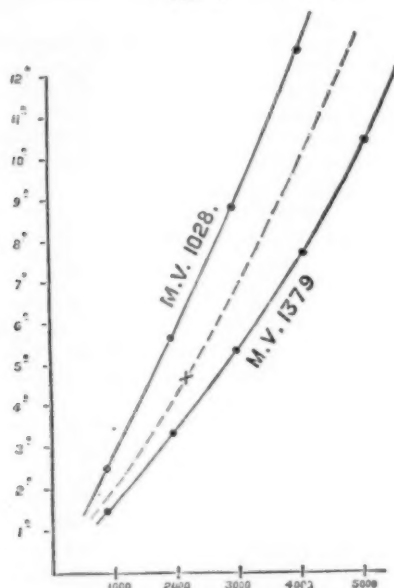
Fig. 2.



cases of the 6" B. L. (80-pdr.) and the 10" R. M. L., each with two separate muzzle velocities. From these curves it is seen how the muzzle velocity affects their range, and, as a practical example, I may say that two years ago, at Sandown, we constructed a range table from Fig. 3, which gave us very good results. We were firing with reduced charges, but found that the indication of the published range table had always to be very liberally corrected by the officer conducting the fire. Knowing the proper elevation for a certain range, at which a good number of rounds had been fired, we had a fixed point on a new curve, which we sketched in between the two others, and the results, as I have said, were very satisfactory. But, as a rule, we are only provided with a range table for one fixed muzzle velocity, so that, if we knew the elevation, different from that laid down, due to a

certain range, we would still be in doubt as to other ranges. I think, however it would be a good thing for a battery commander to have the curves for range and elevation drawn out for his guns, not, of course, for use in action, but for study at leisure. He should also note carefully every round he fires and seek to determine any difference there may exist between guns of the same nature.

FIG. 3.



The influence of tide is only at times important, but it may be very serious: thus, with a B. L. gun on a site say 14 feet above mean tide, the rise and fall of the latter being  $\pm 10$  feet, it might be  $\pm 175$  yards.

The correction for travel is seldom properly appreciated, as our practice targets go so slow and keep at such slowly changing ranges; it may be very serious indeed, and amount to 200 yards or more on service.

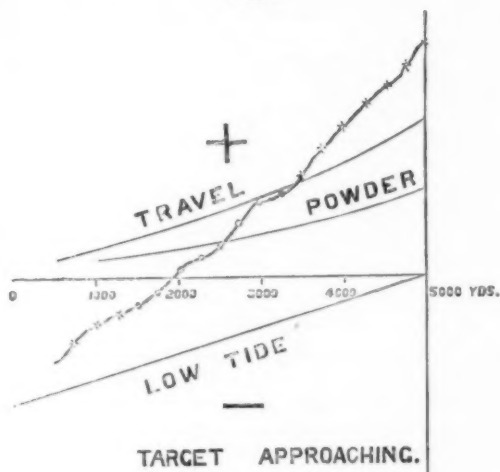
Now the net correction for all these things has to be applied to the range, but if it is left to one person to account for all, how possibly can he do so? Let us look at Fig. 4, which is perhaps an extreme, but at the same time quite a possible case: it is there seen that the disturbing causes are not constant in their effect, and are sometimes cumulative, sometimes conflicting. Even if we had to deal with "travel" only, I do not think very good results would be obtained by correction shot by shot: we have got to divorce ourselves from the idea, that rules applicable to target practice are any good on service.

I think that when the corrections for tide and powder are necessary they should be dealt with in the elevation given to the gun; that is, by some

mechanical means, either applied by clinometer or index plate; the former can of course always be eliminated by using Case I., but I should be loath to give up the many advantages of quadrant elevation.

General J. B. Richardson, Captain P. J. R. Crampton and, I believe, others, have written on this subject, which certainly wants working out.

Fig. 4.



The corrections for travel should be, if possible, embodied in the range given to the guns. This can be done, I think, simply enough when using the position-finder, but with the depression range-finder it is not so easy. At one time we had "fighting books" with tables drawn out for this purpose; these tables, accurately calculated on assumptions which could hardly be made correctly, are things of the past, and we have drums which at all events are logical in their working; the first idea of their principle was due, as far as I know, to Capt. A. G. Scott, R. A.; but even these would be difficult to use in action, if the targets had speed and there was much smoke about. A duty so difficult, and for which no thoroughly satisfactory mechanical aid is forthcoming, should certainly, when possible, be in the hands of an officer of experience, and I have already stated my opinion, that the battery commander should retain it in his own hands, but as we have seen, circumstances may arise where it will be practically in the hands of a gun captain.

#### COMMUNICATIONS.

My next point is communications: I think, as far as range is concerned, these are in a fairly satisfactory state, and that both clock and electric dials, each in their place, work very well. The electric order dial, also, has proved itself a most desirable adjunct in casemated works, but the broad question of the interior communications of works wants looking into. We

want a good working telephone for what I might call "fighting lines." The Ader transmitter, designed for business offices, is not suitable for this purpose.

#### TARGETS.

My next point is targets: we have now reduced to an almost machine-like nicety, practice with plugged shell at a single slow moving target. I had the pleasure of showing at the Royal United Service Institution, early in the year, the excellent effects of a season's practice in the Southern District on a record target, very small in comparison with a service objective. The Commandant of the School of Instruction at Plymouth has also shewn me, what I would call a magnificent record of results, obtained this year at Picklecombe, which would not be regarded as a very easy work to fight. There is no doubt we can hit, and hit often, a single slow moving target, but after all, what is that? We have learnt our sword-drill, we must endeavor to acquire swordsmanship. To do this, we want better targets and more practice. An endeavor no doubt will be made to obtain the first; the second can be met by instructional batteries, from which the comparatively cheap 64-pr. ammunition can be fired.\*

#### THREE OTHER POINTS.

Three other points remain, but I will only indicate them, as I am without any practical experience of any of them. The first is shrapnel shell fire, with time fuses. I am a believer in the heavy shrapnel, even at night, and I should be glad to see something done, to provide a better time fuse, and to further test this projectile. The second is high-angle fire; this is in its infancy, and we all look forward to extended trials; the third, and perhaps the most important, is the ranging and control of quick-firing guns.

#### TRAINING.

Lastly, I would say a word as to training. I think each officer, each link in the chain of command, should have definite opportunities for training his own particular unit. Gun group commanders should take their detachments in hand, as a subaltern of a field or horse battery takes his section; he should train his gunners, through their gun captains, in their own special work, pointing out the great number of mistakes that can be made, the adjustments that must be looked to, the use of the clinometer in testing elevating gear, racers, etc., the effect on the shooting of bad drill or loss of time; he should practice the various methods of laying and the easy transition from one "Case" to another; he should cultivate the intelligence of the men, by explaining "what it is all about," and interest them by showing them diagrams of the effect, on various supposed objectives, of the rounds actually fired by them. He should especially train his gun captains, and consequently himself, at the same time, in the observation and correction of fire, taking advantage of the practice of other batteries for this purpose.

\* I do not wish to be understood, as undervaluing the good effects of actually working and firing the guns of the service armament; this should, of course, never be discontinued; but in addition, thereto, an allowance of 64-per. ammunition, for instructional batteries, would be of the greatest assistance, to efficient training.



pose. He should never forget that he himself, or his gun captains, may be called upon to do this.

The battery commander should have opportunities, in an instructional battery, of seeing his detachments at work together, learning smart and soldier-like drill, which will bear fruit when they are perhaps scattered, by the necessities of a permanent work. It is very difficult to inculcate real smartness in work, when men habitually drill in isolated pits. He should teach his men to look on their gun-floor as a place of parade, to be treated with all ceremony and decorum: in his own particular command, he should practice complete manning and if this is impossible for want of men, he should weaken his detachments, so that, while every gun may be supposed to be in action, range installations and communications should be fully manned. At drill, change of system should be often practiced, for it must never be forgotten that smoke may, at any time, throw us back on Case III. He should see that his subordinates understand the work of a higher grade, and occasionally make them take the place of battery commander under his observation. Seeing that rounds of service ammunition are so precious, he should take care to get as much information and instruction, from every shot, as possible; he should, especially, study the results of his firing, and discuss with his officers the various faults that are sure to crop up. There is not nearly as much discussion of practice as there might be. Above all, he should himself lead in the study of the water-way; officers and non-commissioned officers should know all the channels under their guns, where the five fathom line runs, and the ranges to any points, rocks, buoys, lights, etc., that are visible. *Viva voce* examination on the ground itself, as to this matter, would be very useful.

It is especially necessary that fire commanders should often take tactical charge of their commands; all command posts, communications, range-finding stations, dials, etc., being put on a war footing, even if the detachments can only be represented by gun captains; then the smooth working of the whole can be tested. The coast defenses of the empire are now being told off into fire commands, and when this is accomplished, these tactical exercises should be constantly practised, always with some definite object in view.

With regard to what I have said on training, I in no way wish to pose as putting forward anything new: the points I have drawn attention to, and others I have omitted, are, I doubt not, well known and practised in some places, whilst in others, local circumstances entirely prevent anything of the kind, except in a modified form. I only say, when it is possible, it ought to be done.

In conclusion, there is one other matter, very germane to the present subject, which I would beg permission to touch on: I think every effort should be made to encourage *esprit de corps* amongst the younger officers. A subaltern, for example, would be more happy and have less of that feeling of unrest, if he had more, I will not say to interest him, but more to do him credit, something to take a pride in. I know there are many practical difficulties in the way, but if a certain portion of a gun-floor was an officer's own, so to speak, and if he were more intimately associated with the train-

ing of a definite portion of the battery, we might hope to establish in the garrison artillery that healthy emulation which exists among section officers in the mounted branches. Drill that is not carried out smartly is worse than no drill, and this smartness is very difficult, nay impossible, to obtain when an officer is in charge of squads 200 feet apart; there can be no interest in the drill, and the men get into slovenly habits, while the officer often consults his watch, but, on the other hand, there are parades, which would convince anyone, that there was no prouder command than a smart battery of garrison artillery. When local circumstances permit, regard should be taken of the place of parade.

There is also an idea that in the garrison artillery there is little chance of active service; as to that, I think if we read the records of the regiment, and look back upon its story of honorable endeavor, we shall have to admit that the garrison artillery—the sturdy trunk from which the regiment, sprang—has, in comparison with its more brilliant branches, borne a fair share of the heat and burden of the day, and that it may claim to an equal heritage in that long record of services, which is crystallized in our motto “Ubique.”

## Military Notes.

### THE STATUS OF MEDICAL OFFICERS.

A PAMPHLET recently sent us by a prominent officer of the Medical Department contains an interesting article which he devotes to describing the "Outlines of the Sanitary Organization of some of the great armies of the world."

Among other subjects he discusses the status of the medical officers of our own service, and cites the following act of Congress, with his comment thereon.

"The following Act of Congress was approved July 27, 1892: That, from and after the passage of this Act, the grade of certain medical officers of the army below that of surgeon-general shall be as follows: Those holding the rank of colonel, assistant surgeon-generals; those holding the rank of lieutenant-colonel, deputy surgeon-generals. That before receiving the rank of captain of cavalry, assistant-surgeons shall be examined under the provisions of an Act approved October 1st, 1892. That medical officers of the army may be assigned by the Secretary of War to such duties as the interests of the service may demand. That all Acts or parts of Acts inconsistent with the provisions of this Act are hereby repealed. The third section of this Act abrogates Section 1169 of the Revised Statutes, viz.: 'Officers of the Medical Department of the army shall not be entitled, in virtue of their rank, to command in the line of the army or in other staff corps'; and places the Medical Department in the same category with that of the staff corps, as set forth in paragraph 16, Army Regulations, 1889."

At the time this third section became law the reason advanced for its adoption seemed to indicate that its purpose was to enable medical officers to hold positions abroad as military attachés in order that they might profit by study and observation of foreign methods and appliances. This later "interpretation" appears in the light of an afterthought or of an opinion held in abeyance at the time of passage of the act. So little did the inner meaning of this section reveal itself to certain minds that we find no mention of it in the new edition of the Army Regulations for 1895, where paragraph 18 reiterates one of the same number in the regulations of 1889 as though nothing had happened to alter the *status quo*.

The order of the President directing "that the following Regulations for the army be published for the government of all concerned, and that they be strictly observed. Nothing contrary to the tenor of these Regulations will be enjoined in any part of the forces of the United States by any commander whomsoever," would seem to imply that we had solid basis of law to rest upon; yet hardly is the order dry upon the page before we re-

ceive the dictum that this particular portion of the regulations is in error and that the statute on which it rested has been abrogated.

The terms of the Geneva Convention appear to have application to the case also and the question arises, can a medical officer attain the condition both of a combatant and a non-combatant under these terms? for this is what the situation practically amounts to.

When the medical officers who had acquired five years of service in 1895 were thereby promoted to the rank of captain of cavalry, they jumped over the heads of fully three hundred officers of all arms. Some of the officers thus overslaughed were serving under fire in the war of thirty years ago, before these young assistants were born. Such an enormous advantage in rate of promotion coupled with the added right of command would place the medical officers in a position to dominate the whole service.

The advantage of being a professional soldier grows beautifully dim in presence of such a prospect; better the profession of medicine as the quicker means of attaining what combatant officers can arrive at only after years of honorable service and hard experience.

In efficient foreign armies the right of command is hedged about with restrictions which practically confine it to soldiers of proper attainment and experience in handling combatant troops; the responsibility is too grave under modern conditions, the lives of men too valuable, to do otherwise. We can imagine what a German or French officer, who apprehended the circumstances of this case, would write if called upon to review the claims set forth in this pamphlet.

We give below a table showing the proportions of field officers to captains and lieutenants and the rate of promotion to captaincies among officers of certain branches of the service.

PROPORTIONS OF COMMISSIONED GRADES IN U. S. ARMY BELOW THAT OF GENERAL OFFICER.

	Field Officers to Captains.	Field Officers and Captains to Lieutenants.	Captains to Lieutenants.	Rate of Promotion to Captain.	
				Under operation of law. Years.	Service as Lieutenants. Average in cases of last 5 Captains in each regiment. Years.
Medical Department.	1 to 1.12	1 to 0.25	1 to 0.48	5	
Ordnance. . . . .	1 to 1.41	1 to 0.3	1 to 0.5	14	
Engineers . . . . .	1 to 0.71	1 to 0.53	1 to 1.27	14	
Cavalry. . . . .	1 to 2.4	1 to 1.53	1 to 2.17		16.1
Infantry . . . . .	1 to 3.33	1 to 1.7	1 to 2.2		18.3
Artillery. . . . .	1 to 2.4	1 to 2.3	1 to 3.25		23.9

NOTE.—Length of service of present first lieutenants. October, 1894.

	Length of service of the first five lieutenants in each regiment.	Length of service of the senior first lieutenant in each regiment.
Cavalry, average for the 10 regiments. . . . .	15.1 years.	16.2 years.
Infantry, average for the 25 regiments. . . . .	15.5 years.	17.3 years.
Artillery, average for the 5 regiments . . . . .	25.7 years.	26.9 years.

NOTE.—Medical officers enter the service as first lieutenants.

The medical department consists of 1 officer with rank of brigadier general; 6 with rank of colonel; 10 with rank of lieutenant-col.; 50 with rank of major; 74 with rank of captain and 36 with rank of first-lieut. Nothing can more clearly prove, if proof were necessary, the great advantage possessed by medical officers over all others, and if these officers are to possess the right of command the question not unnaturally arises, why should not they be placed under the same law with respect to promotion to captain as in other staff corps where the officers enter as lieutenants? *i. e.*, the 14 year law.

Command usually goes to the senior and it seems hardly just that medical officers should always be senior in rank to all others of corresponding age and service under such circumstances.

But the pamphlet mainly pleads for a further extension of the Hospital Corps, U. S. A. and here again comparisons furnish interesting conclusions.

The British regular establishment, according to a recent return, numbers 211,442, excluding officers. Its medical officers number 888 and its hospital corps 2521.

The maximum strength of our own army is 25,000, and we have 177 medical officers and 706 hospital corps men. Thus the English, with an army of about 9 times the size of our own, have only 5 times as many medical officers and less than 4 times as large a hospital corps.

Recent reports place the German army at 475,283 non-commissioned officers and privates, and 2072 medical officers. The bearer companies in time of war are mobilized from the train and have no existence, or merely a cadre, in time of peace. The hospital assistants number 3848. Here again, Germany with an army 19 times the size of our own, has less than 12 times as many medical officers and practically no bearer companies in time of peace.

France has 1960 medical officials, including apothecary officers and others, a force only about 11 times our own in an army 19 times as large. There are no bearer companies in time of peace. The sections of infirmiers, hospital orderlies, number 5399 or only about 8 times our own hospital corps.

These figures point clearly to the fact that we already possess a medical equipment, both official and enlisted, much in excess of what our proportionate numbers call for according to European peace standards; and the armies mentioned are far more nearly on a war footing than our own is ever likely to be under peace conditions.

It is no more difficult to train Hospital Corps privates to satisfy modern requirements than those of any other branch of the service; and there is no more reason for maintaining the hospital corps in numbers approximating a war footing than that the infantry, artillery or cavalry should be placed in like condition.

No one wishes ill to the surgeon in his proper sphere, but there are other elements in our service and these are entitled to at least equal consideration.

#### AMERICAN HORSES FOR FRENCH REMOUNTS.

During a recent visit to Indianapolis, Ind., I heard, by a fortunate coincidence, that there was in that city a commission of French officers engaged

in the purchase of horses for the various mounted branches of their military service. Not wishing to lose such a valuable opportunity, I quickly sought their acquaintance, and was very courteously received.

The commission consisted of three field officers, representing the artillery, cavalry and veterinary staff, respectively. My *confrère*, fortunately for me, spoke English fairly well and acted as interpreter, in addition to his professional duties, which were onerous in the extreme. His advice and opinions were decisive, not only on the subject of soundness, but on the horse generally; conformation, gaits, action, etc.

If any one member of the commission objected to a horse, it was immediately rejected, and before being led away a slight vertical line of hair was removed from the near side of the neck by a snip of the scissors, so that it could not be again presented, for some time at least. Everything was done methodically and quietly. My *confrère* informed me that the method of examination and purchasing were minutely laid down in the French Army Regulations.

Although the purchase money allowed by their government was about \$150 for each horse, the commission was allowed much latitude, for I saw horses purchased for from \$110 up to \$225. In fact, they did not let a good, desirable horse go away from them if it was possible to get him.

The horses purchased, being for various branches of the service, ranged from fifteen to sixteen hands high, and from 900 to 1150 pounds in weight. The small horses being for light cavalry, as hussars, whilst the larger ones were intended for heavy cavalry and the artillery.

They were extremely particular as to the anatomical soundness and freedom from blemishes and wire cuts. They also objected to brands of any kind, although they did occasionally purchase a branded horse, provided it was a very desirable animal and had only a very small brand, not larger than three inches, and not conspicuous.

They bought stallions, mares and geldings, but preferred mares for many reasons: 1st. Greater powers of endurance; 2d. Live longer; 3d. Can perform more work on less keep; 4th. Withstand more hardships than horses; 5th. They bring a better price when condemned; 6th. Are said to be more intelligent; 7th. More amenable to instructions and drill; 8th. Can endure the climatic extremes better; and 9th. Less liable to disease.

They were particular that the head should be small and nicely set upon the neck. If the head of the horse could not be flexed on its neck, the animal was immediately rejected. Excoriated mouths, lips and ears, injuries from curb-straps and bits, formed a frequent source of rejection, as animals thus affected invariably resent all attempts at any gymnastic instructions which involve their mouths, as suppling their neck, altering their centre of gravity and base of support, etc., so necessary to the trained cavalry charger.

The commission purchased in all two hundred horses, shipping direct to France, via Baltimore, their immediate destination being the cavalry school at Saumur, where they are to undergo a course of training previous to being distributed to regiments.

In making a purchase, the price of the horse having been agreed upon



by the commission, it was offered, and no hope of a further advance of this was ever entertained, such a course being strictly forbidden by their army regulations; a very wise arrangement, in my opinion, saving both time and trouble. Each animal accepted must measure at least sixty-nine inches chest circumference at the eighth rib.

The commission selected Indiana as their base of operations, after visiting many other States, owing to the superiority and great variety of well-bred horses to be found in the "Hoosier" State. It was a clear case of "putting the parson in the centre of his parish," for, although the rejections were probably eight or ten to every one accepted, the average horses of the former category would have been gladly accepted for the American cavalry service—notwithstanding recent official statements to the contrary. Particular attention was paid to the gait, the walk, trot and gallop insisted upon, no other gait accepted. Horses with vertical shoulders and short pasterns, and swaybacks were rejected on sight.

The *modus operandi* of examination was as follows, as per French army regulations:

All harness was removed and a halter substituted for the bridle, the horses being placed on a perfectly flat, level plot of ground. Then all the members of the board, each acting independently, proceeded to examine the animal with regard to his conformation, one prominent fault being mentioned, as straight shoulders, short pasterns, crooked limbs, ewe neck, big head, short neck, high withers, hollow back of the shoulder blades, sway back, weak loins, badly ribbed back, round chest, excessive angle to the ribs, oblique croup, or limbs malplaced, formed an immediate cause of rejection. But if this examination was satisfactory, he was then led about at a walk and trot. Here lameness, oscillations of the shoulders or croup, narrow chest, wide chest, calf knees, knock-knees, paddling, interfering, speedy cuts, narrow hips, too wide hips, small feet, excessively large feet, weak hocks, too near or far apart, brushing, etc., and low action were quickly detected. If this part of the examination should prove satisfactory, the horse was turned over for professional examination, and they were extremely particular in this respect and took no chances whatever. If finally accepted, he was branded and paid for.

The animals purchased were very well selected, being clean limbed, small headed, compact, short backed, very strongly bound, well muscled horses. Coming, as they all did, from small farms, they were in splendid condition and gentle, and, in this respect, forming a favorable contrast to our military, prairie fed "bronchos." They were all of a kind, intelligent disposition, evidently having been well treated from their colthood. The attendants walked about them fearlessly, handling their limbs and hind parts with impunity. The veterinarian personally examined and handled each limb, and each foot had to be raised and tapped with the hammer, as if being shod, a feat which would be performed at the risk of life and limb if ever our equine military candidates were subjected to it.

The entire performance struck me as being very prompt, business like and systematic in every way. Each member of the commission evidently understood his business, and knew exactly what he was sent to purchase.

There were no words wasted nor an unnecessary one spoken. Horses were purchased in open market direct from the owners, thus saving the sum which would go to the contractor, or middle man, as in our antiquated method of buying from the contractors.

I have no hesitation in stating that it would be an impossibility to select on our Western frontier, at any price, a bunch of horses that would in any respect approach those which I saw purchased in our own markets for the French army, an examination of which disclosed careful selection, keen, educated judgment, and "horse sense" generally, on the part of the purchasers, which could rarely be met with. These qualities were exercised under extremely favorable surroundings, for, in the matter of well-bred horses, Indiana ranks second to none. In 1894 the same commission visited Indiana and purchased a large bunch of horses. These created such a favorable impression, upon their arrival in France, that the authorities there made immediate arrangements for an annual supply from the same source.

I was informed that all the French government stud farms were being discontinued; that all the equine reproducers must be professionally examined and rejected as such, if affected with hereditary disease or unsoundness. All stallions must be registered and examined annually. The produce of stallions, owned by the French government, from mares, the property of citizens, are purchased at stated prices when three years old, if fit for military service. In France horse breeding is directly encouraged by the government offering annually enormous sums as prizes.

The beneficial results of a course of instruction on equine confirmation, etc., which every mounted officer of the French service undergoes, was apparent at a glance. At a word or sign a rejected horse was removed by the attendant (a French soldier). The usual expostulations, praises, etc., of the would-be horse trader were conspicuous by their absence, and even when indulged in, did not receive the slightest attention from the commission.

The horses intended for the French service are bought by special committees under instructions from the Minister of War. Army horses are divided into three classes: 1st. Horses de carrière, for the equestrian schools; 2d. Staff horses for officers; and 3d. Troop horses, the latter being divided into reserve, line, light cavalry and artillery (saddle and harness), and are distinguished according to their qualities as very good, good or passable. The schedule price is neither minimum nor maximum, but is looked upon as representing the value of a good horse in each category. It is understood that a sufficiently large margin is left to the officers of the remount depots for the practice of economy, either by encouraging the production of good horses by paying more for them, and in order to give a proper value to animals that are difficult to obtain, and which might be in private demand.

Staff horses are classed as follows: 1st. Ordinary—regular conformation, medium neck, sufficient power and speed, large head, white color, washed mane, tail or coat, and slight blemishes are included; 2d. Good—sufficient breeding, a good neck, regular conformation, strong body and members, good gait; 3d. Very good—good breeding, good conformation,

fine, expressive head, a beautiful chest, strength, good members, prominent tendons, brilliant gait. The price of an ordinary horse is seventy-five to 150 francs less than a good horse, and the value of a very good horse 100, 150 to 200 francs more than the average. The price of a grey horse is one-eighth less than his class. These data convey nothing absolute, and are only points of reference.

Troop horses: 1st. Passable—medium conformation, defects of equilibrium, want of chest measurement or blemishes; 2d. Good—enough neck, strong body and members, sufficient weight, harmonious conformation, good action, fair physiognomy, solid coat and energy; 3d. Very good—a good physiognomy, neck well attached, good body, beautiful chest, good members, fine coat, power, long gaits. The passable horse, of which a limited number should be bought, commands one-fifth less than schedule price, and the good horse fifty to sixty francs less than the schedule price, while the very good horse is seventy-five to one hundred francs more than average. The grey horse is one-eighth less than his class, and the purchasing of this color should not be encouraged, being unsuitable for war service. Any horse one-fifth less in value than the average should be rejected. It is important to make marked difference in prices according to quality, so as not to be always confined to the average prices for very good and passable horses. The sellers should be convinced that the committee judges impartially and as accurately as possible, and that they pay the military value of a horse. A horse may, in fact, have considerable commercial value, and still be unsuitable for military service. The hollow back depreciates the horse for saddle, renders it unfit for service. It must not be forgotten that a slightly hollow back, with narrow chest, at four years old, will be strong and broad at six. A proper consideration is not always given to the difference existing between the four, five and six-year-old horse. With the four-year-old everything is clumsily builded up; his future conformation must be guessed at—he will certainly gain. The six-year-old, on the contrary, will remain about the same. Still the horse, and especially the mare-grass fed until six years old resembles the grain-fed horse at four. Only the horse which is really worthy of the name should be classed as an officer's horse. We should not yield to any apparent qualities which are not backed by strength and endurance. Reasoning thus, it would very often happen that the officers' horses would actually be inferior to the troop horses.—*M. J. Treacy, Veterinarian Eighth Cavalry.*

#### FIELD FORTIFICATIONS IN MODERN WARFARE.

Lieut.-Colonel Sir G. S. Clarke, K. C. M. G., R. E., lectured on the above subject at the Prince Consort's Library, before the Aldershot Military Society.

The lecturer said the science of fortification was as old as mankind. In the most elementary forms of human society, extemporized defenses played a part in the adjustment of family or tribal difficulties. In all ages fortification must have been intended to serve for one or both of two main purposes. First, to form physical protection by preventing an enemy's approach, or by shielding the defenders from the effects of his

weapons, and thus conferring an advantage in the use of their own; second, to afford moral protection, and by defining in palpable fashion the line intended to be held to simplify the tactical situation to the defenders. Throughout the long record of military history there seemed to be periods at which, for no apparent reason, fortification usurped a leading rôle on the field of battle. Such periods did not always follow the changes in military weapons. For the most stupendous field-works ever constructed we must go back to the days of slings and arrows. The increased mobility of armies, the development of road communication, and the gradual attainment of tactical flexibility tended to restrain the employment of field fortification, but although the extreme limit of both mobility and flexibility seems now to have been almost reached, enhanced importance is frequently claimed for the spade. To meet the requirements of indifferent troops field fortification has been regarded as specially adapted; yet indifferent troops have rarely been able to obtain substantial advantage from field-works, and never when opposed to forces greatly superior in discipline and training. The old-world art of war culminated with the Romans, to whom fortification, frequently on an enormous scale, became a habit. The age of chivalry was not favorable to the progress of field engineering, and in 1700 years few changes appeared. The lines which Marlborough was frequently called upon to attack in Flanders, which he invariably succeeded in piercing, scarcely differed in conception from those of Cæsar except that the engineers of the beginning of the 18th century were relatively moderate in their profiles. As the inaugurator of an era of increased mobility and tactical flexibility, and as the great teacher of offensive war, Napoleon looked to living force as the arbiter of victory, and while himself making few demands on passive auxiliaries was accustomed to make light of those of his antagonist. In his case, however, disaster produced a change, and after the failure of the Russian campaign, and the retreat from Germany in the following year, he ordered strong defenses to be thrown up around Magdeburg, Dresden, Breslau, Dantzic, and several other places. In the Peninsula the Duke of Wellington employed field defenses with consummate judgment. The period beginning with Frederick the Great and ending with Waterloo showed, on the whole, a diminished employment of field-works. While the development of the musket and the field gun appeared to involve increased material protection, the growing mobility of field armies operated more powerfully in an opposite direction. In the period extending from the war of 1859 to the present day, the employment of field fortification appeared to have undergone violent fluctuations. The steady approximation to system, which might, perhaps, have been expected to result from modern science and the exigencies created by modern weapons, could not be traced. If any marked change could be attributed to the breech-loader, it was the increased efficacy of rough and ready defenses completely subordinated to tactical requirements. For the rest, the experience of our own day closely resembled that of the past. The initial attraction of the defensive probably lies in the moral rather than in the physical aspects of field-works. Want of capacity for handling troops in the field on the part of generals, deficient training or morale of the troops themselves, belief in the relative ease and

simplicity of fighting a battle in a fortified position, hope of being enabled alike to restore confidence and to remedy defects of organization and tactical instruction, seem to have been the main motives. The result had rarely justified the means, except in face of an enemy almost equally deficient. The protracted defense of such a position as Plevna distinctly tended to unfit troops and their leaders for offensive operations. It was true that a species of organization might be perfected; but such an organization being directed to a special and limited purpose was unsuited to the requirements of the field. Field fortification in its tactical and less ambitious form would undoubtedly enter largely into the wars of the future. Opposing armies could rarely clash promiscuously together like nebular molecules aggregating to form a new world. Conditions, frequently topographical, would determine which should await the attack of the other. In such a case, the waiting force would resort to hasty defenses, and might do so without lapsing into a purely defensive rôle; while the attacking force if it succeeded in capturing an important point within the position, might be driven to seek artificial aid in delaying counter-attack until fresh troops or further successes had made the foothold secure. If full benefit was to be derived from artificial preparations by the army thus acting initially on the defensive, the preparation must be absolutely subordinated to tactical considerations. The field defenses of the future might be of far slighter construction than those of the past, and really good troops, well commanded and carefully trained in peace time, would derive full benefit from them. In conclusion the lecturer said that, in his opinion, the needs of the future would be best fulfilled by regarding field engineering as an adjunct of tactics, frequently desirable and occasionally indispensable by treating the two subjects as essentially one, and sinking specialism in general military considerations. All arms should share alike the instruction necessary to place a position, deliberately occupied or captured from an enemy, in a state of defense. And while the infantry and artillery officer should each realize the extent to which artificial protection could usefully serve the purpose of his arm, the engineer seeking to understand the real needs of both should bring all the technical knowledge at his disposal to their assistance. Thus safe guarded against all chance of being treated as an object *per se*, field fortification may be trusted to fulfil the conditions, which Napoleon laid down, and its employment would then be "always useful, never harmful."—*United Service Gazette*.

## ARMAMENT OF EUROPEAN POWERS.

An interesting synopsis of the present position of the European powers in the matter of armaments has just been published. At the head of all stands Russia with an army of 858,000 men in peace-times, or a percentage of 9 soldiers to every 1000 inhabitants. Germany comes next with an effective strength of 580,000 men, which works out at 13 per 1000. France follows Germany with an army of 512,000 men, or 14 per 1000. In Austria-Hungary the effective is only 380,000, and the percentage 10 per 1000. Italy comes next with an effective of 300,000, and only 1 per 1000; while the English army is said to have a total effective of 230,000, and a percentage of

6 per 1000. The republic of Switzerland has a force of 131,000, with a levy of 45 per 1000 of the inhabitants; the Spanish army has 100,000 effectives, or a percentage of 6 soldiers per 1000 inhabitants; and the Belgian 31,000 soldiers, or 8 to every 1000 of the population. The combined force of the Franco-Russian alliance, it is interesting to know, in times of peace is 1,400,000 men, and in time of war 9,700,000. On the other hand the Triple Alliance has available on a peace footing 1,192,000 soldiers, and on a war footing 7,700,000 men.

#### CAVALRY AND HORSE ARTILLERY.

Under the auspices of the Military Society of Ireland, Major E. S. May, R. A., delivered a lecture in the Royal University Buildings, on Wednesday, on "Cavalry and Horse Artillery." Lord Roberts, commanding the forces in Ireland, presided, and there was a large attendance.

Major May, having been briefly introduced by the chairman, said: During some years past British cavalry had made considerable improvements in regard to mobility, and if they had ever erred in any way it was on the side of headlong courage. Cavalry could not reply to fire, and could fight only with steel. Regarding the action of horse artillery in coöperation with cavalry, he said the former should be trained daily with the latter, so that the two might learn to understand each other. Mobility was the most vital characteristic which field artillery could possess for coming years, and leaving out of the question its use with a cavalry division, it would always in that respect be most valuable for horse artillery. He would remind them that Napoleon at the battle of Dresden had to take his horses from the commissariat wagons and put them under the guns before he could get them along. They should remember that mobility was the first essential to artillery; that they did not make war on grassy lawns and only in summer weather, and horses would not stand if overworked or underfed; and, if he read the times aright, it seemed that greater work than ever would be thrown on cavalry and horse artillery, and especially on horse artillery in the future. It was the spirit rather than the letter they should observe in considering the subject, and the older wars could be studied by them with advantage. Horse artillery would make use of their mobility and coöperate with the cavalry in the future as they did in the past. If they wanted to find examples of cavalry and horse artillery working with effect they should look to the campaign of 1814, when Napoleon showed the world what that could accomplish even against overwhelming odds. The lecturer gave several instances of the advantages of training together of cavalry and infantry, and demonstrated by means of a map the circumstances under which Albuhera was fought. He asked them to consider, might not guns and cavalry be called on to play the same part as that sometimes played by their predecessors. Could they ensure genius on the part of their leaders any more than they could in the past, and might not the same difficulties once more occur? He contended that a weak flank would have to be protected against an overpowering foe, and British infantry and guns might have to be called on to meet powerful hostile cavalry, and quickness and resolution on their side might be once more demanded if disaster were to be retrieved. It was



best for the guns to go straight if possible, because by going straight they could best get into action. Nothing decisive was ever gained in cavalry attacks except by flank attacks. While it was the duty of the horse artillery to assist the cavalry, the latter were not to wait for the guns to take effect. The lecturer then described the charge of the heavy brigade at Balaclava, and said that was a brilliant fight in which their cavalry soldiers behaved most bravely. The lessons to be derived from that fight were, firstly, that cavalry ought never to wait for artillery when the chance occurred; secondly, that horse artillery and cavalry ought always to line together, and that burdens which were not excessive in times of peace were too great a strain in active service; thirdly that cavalry and horse artillery ought to fight closely together, and artillery leaders should watch the combat closely so as to be able to intervene at any crisis that might arise.

Col. Hutchinson said he could not bring himself to see that it was advisable to take the horse artillery away from the cavalry brigade except under very extreme circumstances.

Col. Benson endorsed what the lecturer had said regarding the coöperation between horse artillery and cavalry. Without that nothing effective could be obtained.

Lord Roberts said perhaps he was the one man in the room who had had the advantage of listening for the second time to Major May's lecture. It was because he had been so much struck with the value of the lecture when he heard it at Woolwich that he suggested to Col. Benson that they should endeavor to persuade Major May to visit Dublin and give the members of the Military Society the benefit of his careful study of this important subject. If he might judge from the attention which the ladies and gentlemen present had paid to the lecture, and to the very interesting incidents which Major May had told them, they must have been as much interested as he had been in the lecture, and regretted that it could not have been prolonged. There was one point which he thought Major May had pointed out, and which he (Lord Roberts) strongly felt—the necessity for the commanders of horse artillery and of the cavalry to understand how to afford mutual support and at the same time to act independently. That seemed to be the key of the whole question. The two commanders must, he could not do better than say, guess how the other was going to act and how he could best coöperate with him. It was of seldom occurrence—and probably never—that there was time for consultation when the enemy had taken up their stand and the attack was imminent, and the cavalry commander had then to decide how that attack could best be met, and how a counter-attack could best be made. There was no time then for reflection. He must trust then to his artillery *confrère* commander to join him with his guns, and must decide on the instant how he is to manœuvre his squadron so that he may be placed at an advantage when the charge was delivered. Possibly the cavalry commander was to outmanœuvre the enemy's cavalry, and he (Lord Roberts) always felt that the cavalry commander in battle required more military qualities more visibly than for any other duties that a soldier had to perform. A cavalry soldier required to be a bold, dashing rider, a man of quick perception, able to see the position, and to act with-

out hesitation. A horse artillery commander must possess the same qualities that a cavalry commander was required to have. On getting the information that the enemy's cavalry was approaching he must gallop in the direction from which it was said to be advancing, determine the position where his guns were to be placed in the short time at his disposal. Everything must depend on the rapidity with which the horse artillery commander made up his mind what to do—the position he chose where his guns should be placed so as not to interfere with the cavalry, and perhaps he would only have a few minutes or seconds to make up his mind. As Major May had said, there was great difficulty in changing the position. It very seldom happened that they would change their position once the guns were unlimbered and brought into action. Rapidity in choosing the position on the part of the commander, accuracy and ability in firing on the part of the personnel, and mobility as regards the use of the guns were the essentials of horse artillery service. The horse artillery were at present unable to fire more than, on an average, 10 rounds of shrapnel or 14 rounds of case with accuracy per minute, and if their guns were to be of any practical use to cavalry everything should be done in time to ensure rapidity of movement, quickness and accuracy of fire. That might not be learned by discussions or lectures. Nothing could be done in that direction except by constant practice. As a result of Major May's lecture last year he found that it had borne fruit at Aldershot, where the cavalry brigade now never paraded without the horse artillery, and every opportunity was given to the cavalry and horse artillery of working together in peaceful times, just as there would be in the field. It was proved that the authorities had taken this lecture very much to heart when they had arranged that the cavalry and the horse artillery should work together. In conclusion he expressed to Major May the sincere thanks of the meeting for his instructive and interesting lecture.—*Army and Navy Gazette*.

#### WAR PREPARATIONS OF JAPAN.

The projected war preparations of Japan, to be completed in eleven years, are: (1) Three more divisions to be added to the army; (2) the navy to be extended to a fleet of 200,000 tons; (3) a government steel foundry to be established. The cost of these above undertakings is estimated at 250,000,000 yen. The annual expenditure for the maintenance of the army and the navy will ultimately be increased by 30,000,000 yen, this increase to be spread over eleven years. Other new works, comprising the extension of commercial steam services, etc., are also included. The estimates for these reach a sum of about 8,000,000 yen. All the expenditures required for the extension of the war preparations are to be defrayed from the indemnity received from China.—*Army and Navy Gazette*.

#### NEW GERMAN CAVALRY INSTRUCTIONS.

The new German cavalry instructions meet with the general approval of the *Militär Wochenblatt*. There may be differences of opinion upon points of detail, says our contemporary, but there can be no doubt that the new instructions meet the wishes of the cavalry arm, which has longed for the

close of the period of experiment and the laying down of definite and durable regulations. Four chief points are drawn attention to by the *Wochenblatt*. Unmounted drill is henceforth to be more carefully directed to its purpose, which is a particular training for the men, and the character of the exercises will approach more closely than heretofore to those of mounted drill. The instructions for the latter are now clearer and more comprehensible, so that doubt cannot arise. Generally speaking, no formations are to be practiced save those applicable to war, and a multitude of formations which had no use save in peace-time are to be abandoned. A chapter has been inserted in the regulations embodying a guide to the employment of cavalry in war, in which, says our contemporary, the principles—partly new and partly drawn from earlier instructions—are so framed that now the cavalry, in fighting, training, and character, is equal to the other arms. The force will henceforth envy neither the artillery nor the infantry, since the formations inapplicable to war which were prescribed in the "Cavalry Regulations" of 1876 have been expunged. At the same time, says the *Wochenblatt*, it has not been possible to go so far with the cavalry as with the infantry, since the former can never be treated so radically as the latter, and its fighting formations are necessarily more limited. Our contemporary adverts to the use of the whistle, which is now general in the cavalry, so giving great facility to officers in the command and leading of their men. —*Army and Navy Gazette*.

## ARTIFICIAL FLIGHT.

Mr. Otto Lilienthal continues to prosecute his experiments on artificial flight with very promising results. His latest machine consists of two superimposed wing-shaped structures, placed about 7 or 8 feet apart.

In a wind whose velocity was over 30 feet a second, he was raised from the top of the hill on which his experiments are conducted, and "carried in a nearly horizontal direction, without even having to run at the start, as is generally necessary." Mr. Lilienthal has evidently approximated very closely to the sailing of birds; such for instance as may be observed from the deck of a steamer in an accompanying flock of seagulls.

Regarding his future experiments he says: "I have made up my mind, by means of either a stronger wind, or by flapping the wings, to get higher up and further away from the hill, so that sailing round in circles, I can follow the strong uplifting currents, and have sufficient air space under and about me to complete with safety a circle, and lastly, to come up against the wind again to land."—*Scientific American*.

## PRACTICAL GUNNERY.

The new drill which has lately been issued for the nine, thirteen, and sixteen-pounder rifled muzzle-loading guns shows us that the authorities are becoming more alive to the requirements of practical gunnery. By practical gunnery we mean, without wishing to coin a new expression, battle as distinguished from barrack-square gunnery. When, some time ago, it was considered advisable that for these guns also, No. 1 should not be encumbered with the arduous duties of laying, we rejoiced. It was a move in the right direction. It was a shadow of practical things to come.

It was necessary. We now read: "His duties at the handspike give No. 1 control over the laying as far as seeing that the gun is on the right target. \* \* \* Are we correct in fancying that we read here between the lines that more attention is to be paid in future to elevation than to direction? We hope so. Certainly recent results of shooting would show that gunners are not sufficiently alive to the fact, that in battle elevation is everything, direction comparatively nothing. Therefore, as long as No. 1 keeps his gun on the portion of the target indicated the layer may devote all his attention to the elevation. The No. 1 now only repeats his executive words of command. A thoroughly practical change this, which shows itself especially in such operations as mounting and dismounting. It was always difficult to train men not to mount or dismount until the word of command was repeated by the No. 1. In battle no one would wait for this; men would obey the first word of command they heard. Therefore, why do a thing in peace that you cannot do in war? The one pace between ranks when falling in for drill is still maintained. Why not have it three paces as on foot parade? Is there any need to add this detail? After the detachment was told off, No. 5 used to strap on the fuse and tube pocket. Presumably No. 3 should now do this on the word "Prepare for action," but the drill does not say so. The position of the detachment when in order of march remains unchanged. When mounted, 6 and 7 are now on the wagon limber instead of being in front of the wagon body, while 8 and 9 are in front of the wagon body instead of the wagon limber. This keeps the numbers in their regular order. In dismounting the word "dismount" is substituted for "jump off," and the instructions that when dismounting for action the numbers should "go to their posts at the gun" are deleted, because in action they naturally would go to their posts on the gun. Axletree boxes are now called axletree seats.

The old drill for changing the position of detachments from the rear to the front right or left and *vice versa* is deleted. Truly a necessary change. How many drills has a recruit wasted while learning to change position round a gun limbered up? Would his detachment ever be in front or on the right or left of its gun limbered up on service? Then why should it be on the barrack square? Far better is it to devote the few hours a recruit has for gun drill to learning laying or service of ammunition, for then he may assist in proving that "*good* artillery kills not few, but many." "Changing rounds when the gun is limbered up" is another wise deletion—another unnecessary drill expunged. "Prepare for action \* \* \* should be given on gun-drill parades as soon as the guns are formed up in the barrack square." This is inserted to resemble, as far as possible, the orders for the service field batteries. It is wise to do this and to keep on doing it, because when the twelve-pounder breech-loader is changed for one which retains its velocity better, the former will, it is hoped, go to the Volunteers; and as they will apparently be the only field artillery available in Great Britain in time of war, it is manifestly our duty to give them, at any rate, the second best guns we have. The details for unlimbering and limbering up remain practically unchanged.

The new position of the numbers round the gun in action shows that

the effect of firing at a dummy gun and detachment has been studied. We have noticed in examining dummy guns when they have been fired at by a field battery how comparatively few hits there ever were on the breech of the gun, whereas the wheels were often riddled. Hence the position of 3 and 4 close to the breech seems safer than the old position. Things have been gradually working this way. In 1885 we remember 2 and 3, 4 and 5, being outside and in line with the front of the wheel, and in line with the breech outside the wheel respectively. Later on we have No. 3 taken from the front of the wheel and placed five yards in rear of it, while his companion, No. 5, retains his place. Now No. 5 is placed well under cover of the limber, while No. 3 goes in close to the breech. Nos. 3 and 5 have exchanged duties, the former firing, the latter loading. No. 4 is the layer, while his duty of attending to the vent is undertaken by 3. The duties with reduced numbers is changed accordingly. No. 5 is the second layer; the third layer is one of the reserve numbers who will have been previously warned for this duty. In coming into action, No. 1 "directs the gun into the line of fire." He must, therefore, have had some previous intimation of the line of fire. Hence the question arises: Is it, or is it not, advisable to have separate drills for "action right" and "action left"? While granting the usefulness of coming into action under certain rare (?) circumstances by these methods, is it advisable to hamper men with any extra drill which is not absolutely imperative? We consider "action front" and "action rear" sufficient. For other directions of the line of fire, No. 1 can always throw round the trail himself assisted by the wheel numbers. Time is of such moment nowadays, and battle efficiency, though indispensable, so little practiced. The words of command for loading are rewritten, but the detail is little altered. It might be noted that in serving the vent, No. 3 is ordered to place "his right thumb on the vent." This is awkward for the layer when he is laying with his right tangent sight. In this instance, perhaps, if No. 3 used his left hand and his fingers on the left side of the gun, it would be better? No. 4 "should keep his gun laid whether it is loaded or not." It was well to put this in although many layers used to do so before.

Other alterations are, many of them, in wording, and the majority certainly alterations for the better. There is a useful drill added for "aiming posts" and a table of signals. In the latter, might we not suggest the whistle being used to call the attention of the battery that a signal is about to be given? Otherwise, as an instance, would not the section commanders and layers have to keep their eyes continually on the battery commander to watch for his signal, "both arms held up vertically" to fall out to him? They have other important things to keep their eyes on besides this. There is also a useful chapter on the method of drilling recruits which may be studied with advantage. One point we wish to dwell on—the words, "Go on, No. —." In drilling recruits at sixty-four-pounder drill, the instructor is told to say, "No. —, go on." This shows that uniformity is not perhaps kept up as it should be, and that one drill is written apparently without comparison with others. This is only a detail, some might say, not worth noticing, yet we must aim at thoroughness in everything. If an instructor

at sixty-four-pounder says, "No. 2, go on," the same instructor when he drills at nine, thirteen, and sixteen-pounder must say, "Go on, No. 2," and if he does not he should be corrected, otherwise he is at once performing an act of disobedience and undermining, if ever so little, the foundations of discipline. On the whole, however, the new drill may be welcomed as a distinct advance. We hope it may herald the days when worn-out ideas will disappear and modern ones replace them. We want "good artillery."—*The Army and Navy Gazette*.

#### A STEERABLE BALLOON.

The Prussian general staff, it is said, is enthusiastic over Count Zeppelin's steerable balloon, which can rise 1200 yards, travel eleven miles an hour, carry two tons, stay up fully a week, and ascend and descend without throwing ballast or losing gas. It utilizes aluminum in the motor and steering gear, but the principal novelty is a secret preparation, or sizing, making silk entirely gas-tight. The cost of one will be \$75,000, but its value in time of war as a look-out over a vast range, either by sea or land, will be incalculable.—*N. Y. Times*.

#### HIGH-EXPLOSIVE SHELLS.

The Prussian *Jahrbücher für Armee und Marine* communicates the following results of experiments in Switzerland with high-explosive shells. The gun used was a 12-centimetre (4.7-inch) siege piece, the shells of cast iron; and the charge *Weiss-pulver* (white powder), one of the new high-explosive compounds which we have been unable to identify. At a range of 20 metres against plank targets, the cone of dispersion, as ascertained from hits on the targets themselves, was 96° only. As computed from the hits on the ground, 910°; no splinters appear to have struck back. At 2000 metres, the normal horizontal angle of dispersion was 145°; still no splinters were projected backwards. At 2172 metres the mean dimensions of the craters were: Length, 8.5 feet; breadth, 8 feet 4 inches; depth, 3 feet 10 inches. The short fortress gun (practically howitzer) gave much poorer results. The smoke thrown up by the explosion was in all cases satisfactory, and out of the 356 shells expended none burst in the bore.—*Journal R. U. S. I.*

#### THE NEW FRENCH REGULATIONS FOR FIELD ARTILLERY.

What will especially strike a reader of the two small volumes just issued by the French war minister is the progressive nature of the methods of instruction which they inculcate, and the apt manner in which the capacities of those under tuition are legislated for. A carefully-graduated system of training is subdivided into the *école du canonnier-conducteur*, the *école de section*, the *école de la batterie*, and the *école du groupe*; while finally we have a chapter on the manœuvres of several *groupes* united together under one command. Each of the officers, be he sergeant or general, in command of the various units here indicated is, for the time being, the chief schoolmaster; he presupposes that the curriculum corresponding to the units inferior to his own has been mastered, he economizes energy and time, and deals only, therefore, with matters which lie in his own especial province. The keynote throughout is, in fact, decentralization; and nowhere is that over-



much or overlittle, which too frequently tends to mar such manuals, conspicuous.

The book differs from our drill book in so far that it deals only with mounted drill and stable duties. There is no gunnery in it, no foot parade work, and no hints for gun-pits, bridges, or such shifts and expedients as may be useful on active service; we find but very little connected with "ceremonial," and no special chapter on "tactics." On the other hand, the details of harness-fitting and the various parts of the harness and horse equipment are explained most lucidly and minutely, and a series of illustrations and diagrams is added to aid the learner, which is a model of clearness and minuteness. Such plates no longer figure in our drill book, and, doubtless, many who see the French ones will wish that similar assistance was provided for our recruits and young officers. It is the portion termed *école du canonnière-conducteur* wherein these diagrams appear, and it may be said that an exhaustive thoroughness and attention to detail is the salient feature in this, the elementary part of the book. In the portion in which the *école du groupe* finds a place, on the other hand, the details are comparatively few, the movements to be practiced are kept as simple as possible, and there is a large margin allowed for individual resource amongst the batteries.

That we may learn something from the methods of our neighbors is not impossible, even though we may not be prepared to admit the inferiority of our own.

The broad features of artillery tactics are much the same amongst all the nations of Europe. The formations and principles of drill and manoeuvre are very similar, and we find a very general resemblance in the methods of ammunition supply. It is not necessary, therefore, to enter into a close examination of the system laid down in the pages, but it may be interesting to note one or two points where it is suggested that "they order these matters better in France," or at any rate with a more liberal regard for the difficulties of commanding officers.

But first, with reference to a very simple matter indeed—a mere question of nomenclature. Is not the word "group," to describe the tactical unit of artillery, infinitely preferable to our cumbersome and absurd "brigade-division"? Officers of all arms know what a "brigade" means, and are all familiar with the term "division," but they may fairly wonder how or by what process of logic three batteries when drawn together under one command came to be described as a "brigade-division," and may be justly puzzled as to how it can either conveniently or reasonably be referred to by so monstrous a title. The word "group" would not bewilder our brethren of the other arms, has the merit of briefness and simplicity, and is, moreover, a recognized title amongst artillerymen at present. We have all heard of a group of guns in a fortress, and would not be startled violently were a similar designation to be applied to batteries on shore.

To return to the French drill book. The system of decentralization recommended by it has already its counterpart in our regiment, and the best results have always attended it amongst us. In the artillery, a section officer has with us for years enjoyed a certain responsibility, and there can

be little doubt that his powers of command have been fostered and developed by the fact. It may not, however, even now be quite superfluous to notice the French views on this subject. In the school of the section, we are told, are to be practiced and taught all the movements which will be required from the men when the battery is being drilled as a whole. It forms an intermediate step between the teaching of the *canonnier-conducteur*, and that of the captain, who in the French service commands a battery, and teaches the non-commissioned officers the art of leading men. It is an error, it is contended, to suppose that the course of instruction is delayed by it; on the contrary, it is hurried on. For the instructor, having only a comparatively small number of men to supervise, is able to devote more individual attention to each, and to help them in their difficulties. Moreover, since the section has its own proper life, and retains its own individuality, even when the whole battery is working together, it is specially desirable that those who compose it should learn from the first to look to its leader for guidance.

In the "school of the battery," while what we should term the "deliberate method" of the occupation of a position is under certain circumstances encouraged, the direct method is apparently regarded as the normal one. "The greatest latitude, however, is to be extended to the captain in the choice of his methods."

In the "school of the group," any modifications in the *Réglement* of 1888 are in the direction of allowing captains a large discretion in the choice of their methods of executing movements. The exercises of a group are limited to a very small number—regard to the configuration of the ground is always to be held in view; and the general object of the evolutions practiced should be such as will teach a group to mass itself at a given point, to deploy from it in a line of columns, and finally, to place itself in a position for action. Changes of front and evolutions carried out otherwise than by the aid of a line of columns, although useful in developing the *coup d'œil* and readiness of officers, are nevertheless only to be taught exceptionally, "as they take up the time which can be more profitably devoted to the training of the men in matters of detail."

In changing from one position to another when it is desired to take advantage of cover afforded by the ground, it is advisable to allow each battery to follow the path it finds most favorable, and not to attempt to lead the group in one column or to reform it in mass.

In the reconnaissance of a position, while a methodical plan is indicated as much as possible is to be left to the initiative of group commanders (*chefs d'escadrons*) and captains, so that they may act according to the exigencies of the moment.

Finally, the Committee of Artillery report to the Minister of War that in order to facilitate the movements of batteries, and to enable them to avoid impassable places or ambushes, it is desirable to place at the disposal of group commanders a staff whose duty it shall be to look after the security of the batteries—men, that is to say, who might scout for them on the line of march, and whose services might usefully be employed later on in observing the effects of fire. That we have a similar need in our service, has more

than once been pointed out by officers of our artillery. The demand for such scouts, and for a staff for the commander of what we call a brigade division, is well recognized, and is even already legislated for, though in a manner more or less *impromptu*. It would seem, however, that a special organization bearing official sanction and carried out at all the larger artillery stations, such as would leave the existing personnel of a battery untouched, would be desirable, not only because of considerations affecting the battery itself, but because greater efficiency in the duties of scouting, observation, and the carrying of messages would be arrived at. The paragraphs dealing with these *liaisons* in the French drill book run as follows, and are given in their entirety, as they will probably be of special interest:

"The duty of securing the transmission of orders and information amongst the various organisms of a command is entrusted to a special personnel known as *agents de liaisons*."

Those *agents de liaisons* who do not belong to the commissioned ranks are often simply termed *agents*. (For example: *agents des échelons de combat*.)

Every order transmitted through an *agent de liaison* should be sufficiently brief to be easily remembered and repeated textually by him.

If the order is to be acted upon immediately, it is to be terminated by the word *exécution*. In the opposite case, the person who receives the order gives his preparatory command if he has occasion for doing so after its reception, and waits for the signal or trumpet call *exécution*.

The *agents de liaisons* are carefully trained in delivering orders correctly and without hesitation. Before moving off it is ordered that they should repeat in a loud voice the order which they have to carry.

As regards the pace at which these *agents* are to move, it is laid down that they are to start for the first ten metres at a walk and are then to gallop. When they return to the presence of their chief, after having delivered their message, they are to move at the trot. Each unit on a war footing is to tell off an *agent* permanently, who is to march with it; the regulations laying down exactly when he is to leave it and to whom he is to report himself for duty.

Each battery sends such an *agent de liaison* to the *chef de groupe*, and each *echelon de combat* (as the wagons in the second line of a battery are termed) to its commanding officer.

It will be noticed, therefore, that the *chef d'escadron* in command of a group of field artillery is always assisted in the field by three specially-trained non-commissioned officers, who act as his *agents de liaison*, and a trumpeter is also told off to him permanently. The regulations tell us that "whatever be the formation these non-commissioned officers place themselves in line four metres behind the *chef d'escadron* in the same order as their batteries, while the trumpeter places himself on their left." Each of these *agents* is only to be used exclusively for duty between his own battery and the *chef d'escadron*. No definite rules as to the exact rank of *agents de liaison* can, we are told, be laid down, but it is a first necessity that the transmission of messages should be certain. Therefore, whatever their rank, only such men are to be chosen as have natural aptitude and

possess the necessary knowledge, and they must be carefully educated beforehand in such a way that they are completely imbued with a sense of what their duties demand from them.

Certain rules rigidly govern the performance of these duties :

An *agent* is never to be given more than one message, and is to devote his attention wholly and entirely to the two authorities whom he places in connection with each other. On the other hand, the *liaison* is different in the function, and every authority who performs temporarily several functions is to receive assistance from all the corresponding *agents*.

The functions of an *agent* are exclusive of all others ; nothing is to be allowed to interfere with the accomplishment of his mission. He is to study and remember the positions of the officers or units between which he acts ; he must carefully watch their movements, the country or path between them, and must know in what direction to look for them when he again wishes to find them.

Such are some of the regulations which govern the employment of an adjunct to artillery tactics which has been evolved by the necessities and exigencies of modern war. They may strike some of us as almost pedantic in their rigidity and excessive minuteness. But the attention which is bestowed on such means of communication in France seems to argue that a real necessity for it has been felt ; and that the need has created the remedy. That a carefully-organized system on the same lines should be legislated for in our service is the desire of many of our officers, and they will perhaps be interested in details which may be regarded as dry and uninteresting by those not quite familiar with all the difficulties which have to be overcome, or who have not at any rate been brought into personal contact with them.—*Règlement sur les Manœuvres des Batteries Attelées, approuvé par le Ministre de la Guerre, le 25 Mai, 1895.* Paris : 11, Place St. André-des-arts, H. C. Livauzelle, Editeur Militaire, 1896.—*Résumé by Major E. S. May, R. A., Journal R. U. S. I.*

## Comment and Criticism.

### I.

#### "The Military Academy."

By Brig.-General M. D. Harden, U. S. A.

LIEUT. HUBBARD'S article, with the subsequent comments on it, and Lieut. Willcox's article, are most timely and interesting. The commission of educators referred to in Lieut. Willcox's article was brought together by reason of a discussion in regard to *the inefficient education received by the scholars of both private and public schools in Massachusetts*. A Boston newspaper offered a prize for the best article upon a given subject, to be competed for, by scholars of private and public schools, certain Harvard professors being appointed judges. The articles were so poorly written, a discussion arose as to the cause. The teachers of both sets of schools were put upon the defensive, and their admissions were such as to call for immediate action.

There have been many discussions in regard to this matter in my own city (Chicago) the past twenty years. Of late, the newspapers have taken up the subject. Even with their aid no apparent progress has been made to correct the evil of present educational methods. Namely: teaching children of all ages more branches than they can master; teaching the essentials—reading, writing, arithmetic, grammar, geography and history of U. S.—carelessly, and without sufficient time devoted to each study; expending great sums of money upon "fads," which should be devoted to primary education.

There appears to have grown up in our country the idea that it is essential for "every one to know a little of everything." This idea no doubt proceeds from too much reading of newspapers, periodicals and novels to the exclusion of history, literature, science, art, etc.

This idea certainly controls our teachers, however little our learned professors may like it. The teachers fall in with the ideas of the parents, the result is, that we have already become the most *superficially educated* people in the civilized world.

One can heartily sympathize with the college professor who lately exclaimed "Where are our future professors to come from?" Judging from the number of European professors in our new universities, only the "Contract Law" stands in the way of Europeans controlling our universities in the near future.

So long as it is detrimental to a young man to be first in scholarship in his class at our great universities—being socially ostracised, called "milk-sop," and other like names—let West Point, Annapolis and our other technical schools hold on to their *thoroughness*. It was my fortune to see a good deal of the West Point candidates a few years ago, aiding them so far as was in my power to pass the preliminary examination. The few who seemed anxious to lead a military life were as liable as any to fail at this examination.

Very few of the candidates were at all studious, or well informed. They were generally very deficient in writing, spelling, geography, grammar and history, were better informed proportionately in arithmetic. They were the natural product of our present general educational system. They were "pretty well up to date young fellows," knew a

little of many things, but proficient in none. When asked why they could not spell, did not know who commanded our army at Gettysburg, etc., etc., invariably replied "they had not been required to learn," "had passed from one primary study to another before learning the first." Few had graduated at a high school (the highest public school) or at a first class college.

Extensive experience with law clerks and law students (many of the latter graduates of college) would lead me to suppose that these young gentlemen are no more fitted to pass the present preliminary examination to West Point than are the candidates who now present themselves. Candidates who have left school several years before receiving appointments have little chance of passing the preliminary examination.

A word about the age limit. One of the critics of Lieut. Hubbard's article suggests that the candidates are too young, that the age limit should be above eighteen.

A short time before his death, Mr. Abram Poole, the most distinguished librarian (except perhaps Mr. Spofford of the Congressional Library) and one of the best informed men upon educational subjects in our country, delivered a lecture before our literary society upon Harvard University—his *Alma mater*. His principal contention, was to show, that students should enter college at a younger age than they do now. He stated that average age of entrance now is greater than the average age of graduation formerly. That the men who have made Harvard famous, all graduated in their teens, several at sixteen. He stated that the course in former times was far more difficult than at present. That the students were required not only to write essays in Latin but to speak it, etc., etc. He was more severe upon the present methods of his *Alma mater* than are the West Pointers upon ours.

There is no question but that West Point is entitled to a higher grade of candidates than it has now, but it will not be as easy as some think to obtain them.

The students of our best technical schools are young men who have a special desire to earn such a course. They are a select set of young men, not usually "foot-ballers," but natural students. These are the young men West Point and Annapolis should have. I hope that the Academic Board may be authorized to raise the standard of admission; that the course may be kept at four years; that discipline may be kept up; that the course may not be crowded; that the post-graduate schools may be encouraged, brought into harmony with West Point, preferring practice to precept; and that our *Alma mater* may forever be known for thoroughness.

## II.

### "Discipline."

Col. L. H. Carpenter, 7th U. S. Cavalry.

THE subject of discipline and its necessity in armed forces is exhaustively treated in the essays of Captain Ellis and Lieutenant Steele.

Military history from the time of Alexander the Great, the Greeks, and the Romans, show in all wars, discipline and subordination have been the most important factors in securing success.

This is as true now as in more ancient times.

To accomplish this, soldiers must be trained, drilled, instructed and bound to the observance of strict rules and regulations.

The officers placed over them should be efficient, thoroughly conversant with their duties, and by superior attainments, firmness, judgment and honorable conduct inspire respect and confidence. When this is lacking discipline suffers.

The soldier is also required to be subordinate to the non-commissioned officers, to treat them with respect and obey their orders, and as he is constantly brought under their con-



troop in the squad-room, in fatigue parties, in small detachments in the field and on the drill ground, and in reality sees more of them than of his officers, the importance of the status and training of the corporals and sergeants becomes apparent.

Non-commissioned officers should be known in the company or troop as thoroughly able to perform their duties, as accurate instructors, excellent soldiers and of good moral character.

If this is the case they will be obeyed and respected by the men, otherwise there will always be trouble and more or less insubordination.

To bring about this condition, the place should be made so desirable that the best men will seek it, and will be willing to work for it. The pay of corporals and sergeants must be increased. A corporal should receive about \$25 per month and a sergeant \$35. The 1st sergeants say \$40. If necessary, in order to obtain the money, the pay of the private could be slightly decreased, and it would not be unjust to reduce somewhat the pay of a second lieutenant upon first joining the army.

If this increase of the pay of non-commissioned officers were made, it is certain that all of the enlisted men would be more desirous of promotion and more willing to make an effort to get it. If possible non-commissioned officers should associate together, and there should be facilities to bring this about. Too much familiarity with the men, socially or officially, is not conducive to discipline.

The next step after making the position of non-commissioned officer one to be envied, is to properly train men for the duties.

All corporals and sergeants should pass examinations for their appointment, upon drill regulations, guard manual, minor tactics, army regulations to a certain extent, and such other subjects as may be determined upon. The schools for drill regulations and the guard manual and extracts from army regulations should be in the troop under the direction of the captain.

The school for minor tactics, advance and rear guards, outposts, patrols, reconnaissance, map reading, hasty road sketching, etc., should be organized for the squadron, battalion or post, under a selected officer. This brings about the best results usually, a more uniform instruction and more emulation.

In these schools the attendance of all non-commissioned officers and selected privates (suitable for promotion) should be required. The necessary training would be thus given, upon which would be based the examinations for promotion. The result would be a better class of non-commissioned officers and better discipline. No one can deny that this is a most important matter in our army, and one that demands attention and consideration.

### III.

#### "The Royal Artillery."

##### "An Officer of 30 Years' Service."

TO THE EDITOR OF THE *Army and Navy Gazette*: SIR—I venture to hope that you may be able to find space for the following proposal, going a step further than the leader published in your issue of the 12th inst. In any scheme for the reorganization of the Royal Artillery in separate regiments on the cadres of which the officers are borne for regimental promotion as in the existing regiments of British cavalry and infantry of the line, it is necessary to keep in mind the following guiding principles which I have placed, as I think, in the order of their relative importance: (1) That the duties of the mobile artillery, viz., horse, field, and mountain artillery, being totally different from those of the garrison artillery, the organization of the latter must necessarily differ entirely from that of the former; (2) that the regiments must be organized to admit

of an easy system of foreign service relief; (3) the reorganization must fit into existing establishments as much as possible, and, above all, should cause no extra expense; (4) the system of depots and recruiting must be simple and effective; (5) the cadres of officers of the regiments, besides bearing the names of all officers actually regimentally employed, must also allow of a few under the rank of lieutenant colonel to be on the seconded list who, although extra-regimentally employed, would take their promotion under Army rules in the regiment. Now, dealing with the above principles in order, as to (1), the first step to be taken is the absolute separation of the mounted and garrison artillery, a reasonable time, say three years, being given to effect the change, after which the separation would be absolute.

While (1) was being effected the cadres of the new regiments might be prepared, and in order to satisfy (3) the following is suggested: Four regiments of horse and 17 of field and mountain artillery, each with two battalions, one at home and the other in India, might be created. They would consist of three batteries, each battalion under a lieutenant colonel; on the home establishment the batteries would each have four, and on the Indian six guns; thus the home battalion would have 12, and the Indian 18 guns. We would then have 21 battalions at home—252, and the same number abroad—378 guns, which is exactly the existing establishment. The officers actually required for duty with such a regiment, allowing a captain as adjutant for each battalion and another as gunnery instructor, are two lieutenant-colonels, six majors, 10 captains, and 18 lieutenants; and allowing for extra-regimentally employed seconded officers, the cadre for each regiment might be fixed: two lieutenant colonels, seven majors, 12 captains, and 20 lieutenants. Regarding the distribution of such regiments to cover existing stations the following is suggested, single batteries being, of course, available for detachment where such is judged necessary.

*Proposed Distribution of Regiments of Horse Artillery.*

- 1st Regiment.—1st Batn., Aldershot, 12 guns. 2d Batn., Umballa, 12 guns; Seal kote, 6 guns.  
 2d Regiment.—1st Batn., Woolwich, 8 guns; London, 4 guns. 2d Batn., Meerut, 18 guns.  
 3d Regiment.—1st Batn., Weedon, 8 guns; Dorchester, 4 guns. 2d Batn., Bangalore, 18 guns.  
 4th Regiment.—1st Batn., Newbridge, 12 guns. 2d Batn., Kirkee, 18 guns.

*Proposed Distribution of Regiments of Field and Mountain Artillery.*

Regiments 1 to 14....Field Artillery.

Regiments 15 to 17....Field Artillery, 1st Batn.

Regiments 15 to 17....Mountain Artillery, 2d Batn.

- 1st Regiment.—1st Batn., Aldershot, 12 guns. 2d Batn., Rawul Pindi, 12 guns; Peshawur, 6 guns.  
 2d Regiment.—1st Batn., Aldershot, 12 guns. 2d Batn., Mean Meer, 12 guns; Campbellpore, 6 guns.  
 3d Regiment.—1st Batn., Aldershot, 12 guns. 2d Batn., Mooltan, 6 guns Ferozepore, 6 guns; Jullundur, 6 guns.  
 4th Regiment.—1st Batn., Woolwich, 12 guns. 2d Batn., Meerut, 6 guns; Bareilly, 6 guns; Agra, 6 guns.  
 5th Regiment.—1st Batn., Woolwich, 12 guns. 2d Batn., Jhansi, 6 guns; Sangor, 6 guns; Nowgong, 6 guns.  
 6th Regiment.—1st Batn., Woolwich, 12 guns. 2d Batn., Lucknow, 12 guns; Fyzabad, 6 guns.

7th Regiment.—1st Batn., Colchester, 8 guns; Ipswich, 4 guns. 2d Batn., Allahabad, 6 guns; Jubbulpore, 6 guns; Kamptee, 6 guns.

8th Regiment.—1st Batn., Shorncliffe, 12 guns. 2d Batn., Barrackpore, 6 guns; Dinapore, 6 guns; Cawnpore, 6 guns.

9th Regiment.—1st Batn., Hilsa, 8 guns; Christchurch, 4 guns. 2d Batn., Trimulgherry, 18 guns.

10th Regiment.—1st Batn., Exeter, 8 guns; Bristol, 4 guns. 2d Batn., St. Thomas' Mount, 12 guns, Bellary, 6 guns.

11th Regiment.—1st Batn., Sheffield, 8 guns; Trowbridge, 4 guns. 2d Batn., Ahmednagar, 6 guns; Kirkee, 6 guns; Belgaum, 6 guns.

12th Regiment.—1st Batn., Newcastle, 12 guns. 2d Batn., Mhow, 6 guns; Ahmedabad, 6 guns; Deesa, 6 guns.

13th Regiment.—1st Batn., Glasgow, 8 guns, Leith, 4 guns. 2d Batn., Nussarabad, 12 guns; Neemuch, 6 guns.

14th Regiment.—1st Batn., Athlone, 8 guns; Longford, 4 guns. 2d Batn., Kurra-  
chee, 6 guns; Hyderabad, 6 guns; Egypt, 6 guns.

15th Regiment.—1st Batn., Fermoy, 12 guns. 2d Batn., Umballa, 18 guns (mountain artillery).

16th Regiment.—1st Batn., Limerick, 8 guns; Clonmel, 4 guns. 2d Batn., Rawul Pindi, 18 guns (mountain artillery).

17th Regiment.—1st Batn., Ballincollig, 8 guns; Cork, 4 guns. 2d Batn., Quetea, 18 guns (mountain artillery).

The above covers all the distribution of the existing batteries by stations, and leaves the number of guns at home and abroad as follows: Home, 252; India, 372; Egypt, 6—total 630, thus involving no increase of expenditure or change worth mentioning in distribution by stations. Reliefs would be carried out between first and second battalions just as is done in the infantry, while the recruiting and depot work should be carried out on the system of establishing a large depot at Woolwich just as was done from 1860 to 1872 or so, as originally founded by Col. Bingham when he was D.A.G. of the artillery from 1859 to 1865. I believe that the establishment of 21 regiments of artillery as above sketched out would effectually dispose of and settle permanently the case of the mobile artillery, but the problem presented by the garrison artillery is quite different, and it is this problem that I now propose to consider.

Examining the establishment of the garrison artillery, I find that, allowing for another company to be formed into a mountain battery in Natal and added to the Cape of Good Hope command, there are 93 companies distributed as follows; Home, 35 companies; colonies, 31 companies; India, 27 companies. To meet this distribution I think the regimental unit for the garrison artillery should be a regiment of three battalions each of three companies, the battalion under a lieutenant colonel, which would give us 30 battalions or enough to form 10 regiments, of which three should be attached to the Dover, four to the Portsmouth, and three to the Devonport division, no change being made in the existing system of depots and recruiting. The home battalion of each regiment would relieve the colonial battalion every five, and the latter the Indian or eastern battalion, while this in its turn would relieve the home battalion in the same period, thus completing the round of reliefs in 15 years.

#### *Proposed Distribution of Garrison Artillery.*

##### DOVER DIVISION.

1st Regiment.—1st Batn., Dover, 3 companies. 2d Batn., Gibraltar, 3 companies.  
3d Batn., Aden, 3 companies.

2d Regiment.—1st Batn., Sheerness, 3 companies. 2d Batn., Gibraltar, 3 companies. 3d Batn., Bombay, 3 companies.

3d Regiment.—1st Batn., Shoebury, 2 companies; Landguard, 1 company. 2d Batn., Hong Kong, 3 companies. 3d Batn., Roorkee, 3 companies.

#### PORTSMOUTH DIVISION.

4th Regiment.—1st Batn., Portsmouth, 3 companies. 2d Batn., Malta, 3 companies. 3d Batn., Rangoon, 2 companies; St. George's Fort, 1 company.

5th Regiment.—1st Batn., Gosport, 3 companies. 2d Batn., Malta, 3 companies. 3d Batn., Quetta, 2 companies; Kurrachee, 1 company.

6th Regiment.—1st Batn., Isle of Wight, 3 companies. 2d Batn., Malta, 2 companies; Egypt, 1 company. 3d Batn., Jhansi (siege train, heavy battery), 1 company; Mooltan (siege train, heavy battery), 1 company; Campbellpore (siege train, heavy battery), 1 company.

7th Regiment.—1st Batn., Weymouth, 1 company; Jersey, 1 company; Guernsey, 1 company. 2d Batn., Halifax, N. S., 2 companies; Jamaica, 1 company. 3d Batn., Ceylon, 2 companies; Mauritius, 1 company.

#### DEVONPORT DIVISION.

8th Regiment.—1st Batn., Devonport, 3 companies. 2d Batn., Bermuda, 2 companies; St. Lucia, 1 company. 3d Batn., Ferozepore, 1 company; Attock, 1 company; Rawul Pindi, 1 company.

9th Regiment.—1st Batn., Pembroke Dock, 3 companies. 2d Batn., Cape of Good Hope, 3 companies. 3d Batn., Barrackpore, 1 company; Calcutta, 1 company; Allahabad, 1 company.

10th Regiment.—1st Batn., Cork, 3 companies. 2d Batn., Singapore, 3 companies. 3d Batn., Agra, 1 company; Delhi, 1 company; Trimuloherry (siege train, heavy battery), 1 company.

It is necessary to fix the establishment of officers for the cadre of each of these regiments, and bearing in mind that 10 lieutenant-colonels are required in excess of those actually in command of battalions for duty with depots and auxiliary, the regimental establishment works out: four lieutenant colonels, nine majors, 15 captains, 27 lieutenants, one captain being allowed as adjutant and one as gunnery instructor to each battalion. It now remains to fix the regimental establishment, to include extra-regimentally employed, seconded officers, and from the nature of things the cadres of the garrison artillery regiments must bear relatively a greater number of these than the mobile artillery regiments. Taking everything into consideration I have fixed the cadres of the 10 garrison artillery regiments at four lieutenant colonels, 12 majors, 23 captains, and 38 lieutenants. These cadres, and those of the mobile artillery, would give us very nearly the existing establishment of officers and the totals of all ranks of the regiments practically identical with those now included in the last army estimates, or a grand total of about 37,000 men and 12,000 horses.—*The Army and Navy Gazette*.

#### Army and Navy Gazette.

The Royal Regiment of Artillery has long been the admiration of all armies for its smartness, for the exactitude with which its duties are performed, and for "the bravery of its gunners." The *esprit de corps* which animates it was a few years ago so intense as to amount nearly to a religion, and was unhappily the means of obscuring the vision of some of its senior officers to the greater duties which Queen and country require of it. What, it may be asked, can be more binding on any officer, or on any body of officers, than to glorify their corps, to live to its honor, and seek its welfare? Up to a certain point the answer is emphatically "nothing." Nothing can be more becoming or more

soldier-like than devotion to one's corps, even if it amount nearly to fanaticism, but there is a limit beyond which this feeling should not be allowed to go, and that limit is reached when the conduct of the corps is out of harmony with the interests of the army to which it belongs. There is a general opinion that in the case of the Royal Artillery the limit has been passed. The spirit by which it once was animated may not have died out, but it expends itself in various directions. In short, a cleavage has occurred which it would be folly to ignore.

The regiment has grown to such a size, and has such multifarious positions to occupy, that it has ceased to be homogeneous. Our wisdom will be found in accepting that fact, and in dividing the regiment into such parts as can best be administered separately. Its present overgrown condition is productive of inconvenience and dissatisfaction as well as of inefficiency. In illustration of this it is only necessary to recall the many complaints of the manner in which business has long been done in the office of the Deputy Adjutant-General Royal Artillery—complaints, be it observed, directed not against individuals but against the system. The enormous cost of the instructional and manufacturing establishments, as compared with their powers of production, has also been justly condemned. These places form a paradise for the *savants* and lecturers of the regiment, who when once they have got in show generally a marked disinclination to come down to the ordinary every-day work of soldiers. But whether it is wise to confine those posts to a favored few is more than doubtful; indeed, it may be questioned whether artillery officers are the proper occupants of some positions now held by them. In any case, if these appointments are regarded as prizes they should be thrown open to the fittest.

It is not, however, our present purpose to consider minor reforms, but to plead for the total separation of the mounted from the garrison artillery. That is the first step towards every other reform; it is the absolutely essential condition on which the continued efficiency of our artillery service depends. As already indicated, several influential officers have opposed the idea, probably owing to their great admiration for the past of the regiment and their loyal faith in its future; but we would submit that if the *status quo* be maintained in the face of new requirements, and in the midst of altered circumstances, the artillery will be heavily handicapped, and the other arms will not have the coöperation which they have the right to expect from it. These views will not appear to be extreme if due weight be attached to the following considerations. As the efficiency of a field force and the success of its operations depend so largely on the state of its artillery, the latter cannot be too highly trained or too frequently practised in conjunction with cavalry and infantry. When the artillery is well officered and well horsed, when it is noted not only for the accuracy of its fire but for its mobility, and the quick intelligence with which proper positions are taken up in support of the other arms and in pursuance of a general plan, it fulfils its mission and creates universal confidence. But how arduous is the path which leads to this standard of excellence, and how few opportunities superior officers have of commanding their batteries or brigade divisions in a mixed force. And yet it is principally by continued trial and practice that faults are discovered and perfection attained. A field artillery officer should be a first-rate horseman and horse master, as well as a collar-maker and farrier for all purposes of supervision, a thoroughly instructed and expert gunner, a strategist to a certain extent, and an able tactician. He must have an eye for country, a quick wit for taking in a situation, and be the trusted leader and friend of all under his command. We have many artillery officers who answer this description, but we want many more, and it is only by making and retaining such officers that our field artillery will continue to do us credit as it has in the past.

In the first place, the officers who prove themselves equal to the duties of field artillery are fitted by nature and inclination for their position. In the next place, they require

all the experience, practice, and training which they can possibly obtain to make and keep them the ideal artillery officers of an invincible British field force. Why, then, are they ever and anon removed to a sphere for which they have no training and no aptitude? If it were desired to insure defeat and disaster no better means could be employed than the removal of efficient field artillery officers from their proper sphere. If they were simply removed the mischief would be the less, but they are transferred to the garrison artillery, where they are worse than useless. Their heart is not in their work, and they are painfully aware that they are in a false position. The officers, non-commissioned officers and men of the garrison artillery have lived laborious days and years in mastering the scientific details of the big guns and ordnance machines by which they are surrounded. The field artillery officer, so far from taking up his place as the superior of the garrison gunners over whom he is set, is conscious that he is inferior in technical knowledge to the last-made bombardier. All this is doing gross and flagrant injury both to the garrison and mounted branches. Common sense and the all but unanimous voice of the regiment demand a change which we hope will not be much longer delayed. The necessity for the change will be more apparent when it is stated that officers who have just become what may be termed completely proficient and trustworthy as leaders of artillery in the field are promoted as captains and majors into the other branch, in which they are quite inefficient. This involves a loss of power and a waste of money which can surely be comprehended by the dullest of taxpayers and the most tape tied of officials.





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## Reviews and Exchanges.

### Military Letters and Essays.\*

HERE are twenty-six essays, developing from various points of view the conviction of the writer, Captain Maude, that the essential principles concerned with the employment of troops in war never change.

Conditions temporarily modified by discoveries in equipment and material give temporary advantages, but ultimately return to the primary elements of discipline defined to be a quantity measured by the endurance of loss under fire,—as the Duke of Wellington intimated when he said at Waterloo, “Hard pounding, gentlemen, but we’ll see who stands it the longest,”—of discipline then and skilled leadership.

Rosbach and Austerlitz will continue to remain examples for all time, “effective ranges and distances only increased.”

Shoulder to shoulder for infantry and boot to boot for cavalry are just as necessary now as ever, and there is great danger in the present craze for “simplicity of movement” and “individual initiative” that all the benefits that always belong to organization and thoroughly combined action may disappear.

Instead of taking so much pains to teach men to seek cover as the prime necessity—each for himself—they should be taught to die if need be, “not how to avoid dying.”

Instead of moving to the attack in scattered, incoherent single units, it must be in bodies capable of government, guidance and delivery at the will of the commander, each in his sphere, down to the company leader.

But contrasting the long service system that formerly prevailed in the French army and the short service system of the German, Captain Maude affirms as one of the lessons of the war of '70 that the possibility of turning out good soldiers in the shorter time is proved. “The constant rehearsal,” he says, “of the same duties sinks into mere routine and neither officers nor men have any stimulus to exert themselves.”

“Instruction in peace time, to be of any use, must be constantly progressive.”

Drill unceasingly up to the point of proficiency and then let go with only enough review to keep the lesson in memory. Not only is it useless but it is directly injurious to run information by repetition into routine, and keep the soldier forever spelling his A B long after he should have been put into polysyllables and even discharged from these.

But it is the vice of the pulpit as well as of the parade ground endlessly to insist upon absolute uniformity, to the production only of martyrs and minarets, until the one shall, we trust, finally disappear in the Millenium and the other—wherever their services may be most required.

Sometimes there is an advantage in not knowing too much. General Taylor, for instance, has never found out to this day that he was beaten at Buena Vista because his opponent planted a force square in his rear.

Instead of acknowledging the move and politely withdrawing from the game as the rules would seem to demand, the General rudely faced about and went on with his work,

\* *Military Letters and Essays*. By Captain F. N. Maude, R. E. Hudson-Kimberly Publishing Co., Kansas City, Mo. Edited by Captain Arthur L. Wagner, 6th Infantry, Instructor in the Art of War, U. S. Infantry and Cavalry School.

on the common sense plan of hitting a head wherever he saw it, whether it popped up in front or behind him.

The "Three days' fighting" characteristic of many of our battles in the last war, due somewhat to the character of the men, was due somewhat also to the novelty of the business not yet become sufficiently "professional" to disclose the danger to lines of communication and bases of supply.

But these things are not the concern of the rank and file. The men of the yellow sashes may be safely trusted with such eventualities as lie outside the field of battle. There fighting is wanted all the time, and this resolves itself not so much into mere firing as final superiority of fire.

This is the point repeatedly insisted upon by Captain Maude. Select the point of attack, prepare it by artillery until the defense is shaken and uncertain, send in the infantry, the first lines in extended order, supports and reserves to follow in close order, keeping down the hostile fire the ruling and primary consideration as securing the best sort of "cover," rather than to look for topographical protection, and generally to be governed by no unvarying scheme of attack—rather modifying this as afforded by chances of time, place, and action, the only fundamental condition being that no body of men, large or small, shall by any scattering escape from the responsibility and control of its immediate commander, who is to deliver what remains of it where it belongs, not only by itself but especially as a part of and in relation to the next whole.

Now the perfect doing of this is an impossibility, but there will be various degrees of approximation, and these degrees will testify to the training and capacity of the leader, whether of group, section, company, battalion, or brigade, and it is safe to affirm that he will know his business best who has worked successively up from company to corps command.

That is the way and the only way a leader can be made, and when made the making of other soldiers to be led by him is an easy matter.

Captain Maude believes that as the adoption of smokeless powder will introduce increased range and exposure, it would be well to go back to especially selected light troops, restricted to individual order fighting, whose waste of ammunition would be the least possible and use of it most effective, while the infantry of the line must learn to follow up as organized bodies the attack without reply and without confusion.

Artillery, he thinks, cannot now be considered as capable of protecting its own front against cavalry determined to precipitate itself upon the guns in masses sufficient to overwhelm them, and the loss need not forbid, so brief is the exposure to which a charge properly executed would amount.

Treating of the cost of war recourse is had to statistics to prove that more men are lost in the undertakings of commerce than in campaigns.

Over such questions we pass very lightly, having long been of the opinion of the philosopher who counted up four degrees of unveracity: 1st, lineal lies; 2d, square lies; 3d, cubic lies; 4th, statistics.

Figures wisely quoted will prove anything, and if the Panama canal be selected as representative of commercial enterprise not even Borodino or Gettysburg has any reason for blushing.

In fact, Captain Maude loses no opportunity for pushing home his text that it is the business of a general not to reduce losses but to keep order,—never to let his men get out of hand. Better lose ten dead out of fifty, bringing the rest where wanted than get ten up to the front with the rest safely scattered at large, hunting cover.

Idolaters are known even in this country, and we have here what Captain Maude calls the "cult of the Prussian official," underlying which is the assumption that what was

done in 1870 is the right thing to do for all time; whereas in Germany itself they now say, "It was done in 1870, therefore it is—wrong."

For in 1870 the Prussian troops did not form that ideal army some people fondly suppose it to have been.

It was in organization and mobility superior to its opponents and by its heads known to be so, and with that they were forced to be content.

There was a great deal still to be learned. There were many blunders made, but they were recognized as such, if not so published, and they were made sources of profit.

And it is intimated that "official reports" are very far from being the accurate and complete authorities supposed by people who refer to them as conclusive.

They are bound, in the first place, to be hurried and partial statements, and if revised afterwards it is oftener in the interest of what is desired to be thought true than of what really occurred. In fact, all history shows that the absolute real occurrence is the most difficult thing in the world to secure.

It may be registered somewhere in the realms of space now occupied by the rays of light that were then silent witnesses, but the copy on the official files is at best blurred and imperfect.

In the matter of equipment many of our officers favor the blanket roll worn across the shoulder. Objection is made that it interferes with the fire of the men when lying down and adds to their exposure.

If slipped off and placed in front it might tangle up a hostile bullet to better advantage than the vermiform appendix, at all events.

Captain Maude everywhere insists upon the importance of artillery. It should, previous to or in connection with, the infantry, prepare the attack, wearing out the nerves it not mangling the bodies of the hostile firing lines by a steady shower of shell, underneath which, if long enough continued, they will become so weakened and demoralized as to lose all accuracy of aim; and when this is the case the attack can be safely pushed in until the position is carried.

The advantage lies with the attack because the chief can select the point and inundate it with such a rain of shell fire—better were the adjective beheaded—"two or threefold the enemy" that recovery becomes impossible.

Superiority of fire upon the point attacked was the secret of Napoleon's method and must remain the essential principle; but superiority of numbers or even of arms does not enter as a necessary factor so much as the superiority established by discipline and the intelligent and coördinated use of weapons and troops. And this can be best accumulated by him who takes the offensive in a particular direction and leaves his enemy the need to be ready for him everywhere.

It is repeated by Captain Maude, in comments upon St. Privat, that the Germans, from the experience of 1870, learned the absolute importance of waiting the result of artillery fire—the infantry participating only when they have reached a position that will make their own fire effective, no formation being a guarantee against loss but the moral power being the decisive factor, no more troops are to be extended than can be used with full simultaneous fire effect in the front, the remainder being kept in the hands of the leader up to the last possible moment.

And he goes on to say, speaking of the attack of the Guards at St. Privat, that the companies advancing in close order suffered less by so doing, and with their impetus carried the wavering lines of skirmishers forward with them,—“for the end in view in a decisive attack close order having altogether the best of it,” what is demanded being no such antinomy as “organized disorder” but coördination, if tactics is to be crystallized into a phrase.

Some account is given of field days at Aldershot, and of French manoeuvres, but no sketches accompany them, in the absence of which and of time to evolve substitutes from the inner consciousness of the reader, we make no comment.

Emphasis is placed upon the necessity for "instant obedience" from the soldier, which must be developed into a habit—direct response to the word of command formed into an instinct, so that compliance prompt and complete can be rightfully expected at all times and under every emergency. Drill secures this but something more is wanted,—the obedience must not only be mechanical but it must be intelligent, and for that education is needed—not as is illustrated by an anecdote drill *or* education, but drill *and* education.

The education contemplated does not seem to be so much based upon the three R's as upon the training of the will—to be, to do, to suffer as exigencies demand—to go without food but never without ammunition—to sleep if opportunities permit but to remain awake if duty requires—to pass instantaneously from all the freedom of the "route" to all the formalities of the parade—or, to sum up, the endurance of an athlete and the obedience of a Jesuit. Well—more to be desired than the philosopher's stone is that man who can hold his fire until he can hit, and hold his nerve always.

Drills and schools will produce him, but he is not a heavenly product after all, and that suggests a question or two not here to be answered; but there is some hope in what has occurred to us that when so much of the devil and all his works as belongs to this world shall have been overcome, our disembodied skill and experience may be profitably transferred to other spheres where celestial troops will need reinforcements from the schools of our old planet.

Sirius may have been waiting for its Austerlitz, Alpha Centauri for its Appomattox.

A method of attack is given as commending itself to some of the survivors of the fighting of 1870. Consecutive lines of sections, each 70 strong, in single rank shoulder to shoulder, the leading sections closing on the centre as losses occur to make room for reinforcement by following sections, each one under and directly controlled by a commissioned officer.

This contrasts with the other extreme of individual stalking of the enemy and thinning more of safety than attack.

"Mass training," however, where the soldier is made a machine simply and responds to nothing but the command of his superior has been largely replaced by individual training, in order to cultivate a capacity for initiative and a habitual right use of responsibility and afford openings for the selection and advancement of those who are thus proved to be fit to trust.

The education wanted is not that which gives a "literary proletariat," a swarm of people who know a great deal that they have no use for, but an education which develops and exercises powers of mind and body, until the scholar has found out what he can do by doing it and so gaining the best of all assurances that he can do it again, out of which comes the self-confidence which compels success.

But the sense of responsibility sought to be encouraged is limited, and due solely to the superior so long as he is there to direct; only in his absence can the inferior be a law unto himself by which he becomes obliged always to do something, which, if not the best that might have been done, is at all events better than nothing, the one thing absolutely without excuse.

"Yet woe to thee if once thou yield  
Unto the act of doing naught."

In the following paragraph we get a limit of dispersion. "The captain controls the fire of his three sections, and can order one to hold the enemy in check along the whole of his front, while with the other two he converges a crushing superiority of fire on any

selected point of the enemy's line. This idea does not descend lower in the scale—to the groups—the fire of ten or a dozen rifles being considered too insignificant to exercise a decisive effect."

As the section contains about seventy men it corresponds for an ultimate fire unit to one of our present companies, the reason being that much more is expected from concentrated fire of this sort than from its dissipation through widely separated groups acting with far less unity of purpose.

It is noticed how the penetrating power of the new rifle will do away with much of the artificial protection heretofore an object, both brick and wooden walls and partitions being cut down by a few volleys at short range.

Of the cavalry as studied by him at the German manoeuvres, Captain Maude says: "The squadron moves literally as one man, obeying the slightest indication of its leader and seeming instantly to adapt itself to every variety of pace and direction, exactly as a first-rate orchestra obeys the baton of its conductor," and this in the manoeuvre of ten or twenty squadrons together.

The figure used to illustrate a charge of sixty squadrons is very significant: "A long black wall, a mile or more in length moved across the plain, eating up the ground like the swiftly advancing shadow of an eclipse."

Of the artillery batteries it is remarked that they worked in coöperation with the infantry, as if by a common instinct, crowding their guns together at less than half interval if a more effective fire was called for, and not hesitating to fire over each other and over the infantry up to the last moment possible; work that seems to us to call for a remarkable amount of confidence in both gunner and projectile.

But the conditions that prevail in the composition and purposes of the German army and to which its state is due as "the most perfect engine of war ever yet put together" do not and never will prevail in this country, nor is it at all desirable that they should.

That war and how to make it must be the sole controlling thought of a nation, from its executive down to the remotest dweller by the wayside if only he has sons to be drilled, is a reversion to the times of Attila and Tamerlane; and the star of empire has taken its way westward to very little purpose if our civilization too is to be built upon shot and shell and fringed round with bayonets.

It seems evident that old King William did not always defer to even Von Moltke. There was wild work among the Germans at Gravelotte, where artillery and cavalry and infantry too were badly handled and put at a tremendous disadvantage by Steinmetz, who, "hurt and annoyed" at some previous censure let temper get the best of his judgment.

Out of it all grew confusion, perplexity and panic, officers and men swept away together right under the eyes of the King.

"His blood was up"—it will be recollected that he was over seventy years of age—"and he ordered Steinmetz to attack with everything he could lay his hands on." Von Moltke endeavored to dissuade him but in vain. Having said all he could he left the King and fell away a couple of hundred yards while the troops moved by with bands playing and officers saluting—to their doom.

Fortunately the situation, bad as it was on the part of the Germans, and it could not well have been worse—"48 battalions stood like sheep in a pen on a space 1600 by 1100 yards and not 300 from the muzzles of the enemy's guns—was not improved. Night had come and it seems the "cease fire" had been sounded along the Prussian lines and also accepted by the French, the call being the same in both armies.

But the critic, now Captain Hoenig, says, "Why could not we go forward? Because we did not understand what fighting means. We did not understand either skirmishing tactics or the employment of lines and columns, and the climax of the day was the bankruptcy declaration of our tactical experts."

And this state of things, so Captain Maude says, is what the Germans have endeavored to correct, while in England and elsewhere they have been building up their military procedure on the lines of the German blunders. Open order on the one hand—successive skirmish lines rushing one after another by fits and starts to the front, each one so widened out as to be practically beyond control of its chief, and all hurrying pell-mell through the dreaded fire zone—on the other hand, artillery preparation of the attack at 2000 yards, a line of picked skirmishers in front marking out the first infantry fire position—then a line following deployed two deep with six paces between companies, with a third and perhaps fourth similarly arranged and at say ten minutes' intervals—this, it is thought, would be attended with less loss and far greater efficiency.

The closing paper is devoted to the new German infantry regulations, a few points in which we notice.

The captain is expected to keep the fire effect of his three sections in his own hands and distribute it where it will do the most good. He uses his own judgment but always with reference to the next whole to which he belongs.

The section—seventy men under its lieutenant—is similarly led. He acts on his own initiative where he has or can have no expressed intention of his superior to guide him, but always, like the captain, so as to “come out” where he belongs as part of the company.

It would seem that it is not only “mere obedience” that is demanded, but the judgment that is in constant training by this method. The very least that a man can do is to obey orders, and it forms the last refuge of the incompetent, as patriotism is said to be the last refuge of the scoundrel.

But by the way, these are half truths only. At the extreme of one appears insubordination, and the man who fancies he can thin out patriotism into a dilution that will encompass the four quarters of the globe better take warning by the internationalism of the Paris Commune, which burns down its native city to prove the warmth of its love for mankind.

What is insisted upon is an obedience that can rise to the spirit of its orders and adapt them to the occasion—competent to act in the absence of the next superior, as he must have acted had he been there.

Time, place, and opportunity call for modifications, and the right man makes the right use of all these, keeping ever in mind not his individual interests but the end and interest of the whole to which he belongs. It is not his own glory he is to promote. He is only to be guided by his duty, and duties involve relations where the individual carefully and zealously subordinates himself to the general good.

In the advance of the fighting line the section and group leaders march in front and the latter regulate direction.

The supports in joining the fighting line may double on those already there or prolong the flanks, and they may, while in support, be formed in line or column as seems most desirable, suiting distance and gait to the needs of each case.

The section leader in giving order to fire must prescribe direction, elevation and nature, whether individual or volley—slow, brisk, or rapid.

The rule for ammunition seems to be the more the better, carried in the pouches and also in the pockets, in the haversack, in the breast; that of the pouches and especially of the right hand pouch to be drawn on last and first re-filled.

Infantry will receive cavalry in whatever formation they may happen to be at the moment of attack. They are not to attempt groups even and squares never, unless the ammunition is exhausted and nothing left them but the bayonet.

Artillery is to be let alone unless the guns can be caught in the act of unlimbering, when no return fire is to be feared.

For artillery up to 1500 yards ought to hold its own against infantry, who, however, are expected to establish their superiority at ranges from 800 yards down.



The formation for attack as skirmishers may be with as many as eight or twelve paces between files, and this line may be fed from as many as four lines in support, each of these at close order.

Finally, troops once under fire must stay there until the end. They may be reinforced but never relieved.

The principle underlying these regulations is evident enough—the training not only of the body but the mind and will, and especially the constant inculcation of fighting as the business of the soldier and the attainment of maximum fire effect up to and beyond—if possible—the very last moment of time—undisturbed by thoughts of cover—of rallying—of retiring; and all this combined into the general scheme and purpose as duty to be rendered through higher to the highest authority so long as life lasts.

We have already been told that conduct is three-quarters of life; and so in war "moral" counts for three-quarters—a fact that would be sufficient to remember if everything else were forgotten.

If this is the kind of literature upon which they feed at Leavenworth, sound and vigorous growth cannot fail to be the result—to be manifested in due time.

H. W. C.

### General Lee.\*

This book is somewhat of a disappointment. One expects to find in such a work some picture of the great personality with which it purports to deal, or, at least, the materials from which such a picture can be constructed. He looks for evidence upon which to base an estimate of character, and finds none, or very little. Instead thereof he finds a restatement of events with which the world is already sufficiently familiar and even that from a partisan point of view. As material for the future historian it can only be considered as secondary evidence; as a statement of facts upon which an estimate of character could be formed it is hardly worth working. There are some flashes here and there in it, but the resulting illumination is too short to be satisfying.

There is nothing speaks the real character of a man so distinctly as his familiar conversations and correspondence. The hasty, unstudied, informal statements, made confidentially to intimate friends, are not only valuable material to the historian, but invaluable to the student of character. It is safe to say that Oliver Cromwell was less understood by his contemporaries and associates than he is by men of the present day who have studied his letters as collected, assorted and edited by Thomas Carlyle. The soul of the man discloses itself in these letters. As one peruses them, letter after letter, written to various people on various subjects during a series of years, the soul of the man begins to shine through, faintly at first, but clearer and clearer as one proceeds until finally the real man, the very soul of him, stands revealed. But the mind must approach such conjuration without preconceived ideas on the subject. If any such exist they are apt to vitiate the picture. For this reason we doubt if the time has yet come when a truthful picture of that great personality which we knew as Robert E. Lee can be drawn. As a commander of men the world has already given him a high position in the temple of Fame, and the indications are that posterity will place him in a still higher niche when his character as a man has been fully revealed. Unfortunately, great men are rare, and not every one of them has his Boswell. The world is still wrangling over the character of Napoleon, although his position as a commander of men has been assured for almost a century.

The private letters given in full; the extracts from others; and the incidental remarks of General Lee, which we find scattered over the pages of this work, are the most interesting and most important parts of it. They are too few, perhaps, and confined to a too restricted field to found a final judgment on; but as far as they go they indicate a high

\* *General Lee.* By Fitzhugh Lee. D. Appleton & Co., New York.

toned religious mind, a kind and affectionate heart, and a doubtful disposition. There is a vein of religious sadness running through almost every letter, and one can hardly conceive that such a man could ever have enjoyed a real hearty laugh. Indeed, we should say it would have taken some courage for any one to laugh heartily in his presence. He was handsome, as well as kind, and therefore attractive; silent and dignified, and therefore strong. His actions as well as his words indicate that he was, at all times, profoundly conscious of the presence of an overruling Providence who orders everything according to the council of His will; and also of the duty, and indeed the necessity of all men, to humbly accept His decrees. Such a man can never be panic stricken. Whatever his Christian creed may have been, his ideas were Calvinistic.

But we must not presume to judge on insufficient evidence. What we have already said rests on a foundation too narrow to be stable or satisfactory, even to ourselves. It is merely our judgment on the evidence before us, tintured no doubt by preconceived ideas, operating unconsciously and against our will. Evidence and not opinion is what posterity will demand of this generation in regard to its great men. They, not we, are competent to judge.

That such a man as General Lee could act impulsively under any circumstances is hardly conceivable; and yet there is at least one episode in his career which cannot be otherwise accounted for. He tendered his resignation as an officer in the United States army April 20th (87). He went immediately to Richmond (89). "His coming had been anxiously looked for" there (89). He was at once nominated to be a Major General and Commander-in-Chief of the Virginia forces, and immediately confirmed by the State Convention. "The next day," which could hardly have been later than the 22d, "Major General Lee was invited to appear before the convention," etc., etc. (89). Now, his resignation as an officer in the United States army was not accepted until the 25th (95). So, three days, at least, before he ceased to be an officer of the United States army he had accepted the position of Major General in the army of its enemy and entered upon his duties as such.

From a psychological point of view General Lee's case is somewhat startling. He was an educated soldier and knew that he could not sever his connection with the army by merely tendering his resignation. He had an interview with General Scott on the 18th, and, seemingly, did not then feel the pressing necessity for immediate resignation. Yet on the 20th he writes to that officer, "Since my interview with you on the 18th instant, I have felt that I ought no longer to retain my commission in the army" (88). The Virginia Convention voted to secede April 17th, which must have been known to General Lee on the 18th and was probably the cause of his visit to General Scott. Something therefore must have occurred between that date and the 20th to cause such a sudden change of mind. Perhaps he received a call from the Governor of Virginia on the 19th to command the military forces of his native state. He could not reply favorably to such a call, while he held a commission in the United States army. Hence the tender of his resignation on the 20th, his immediate departure for Richmond, and the fact that in Richmond "His coming had been anxiously looked for" (89).

We believe that in this case General Lee acted hastily and on the impulse of the moment. Loyalty to his native State could hardly be pleaded in justification of such an act, and is not so pleaded by General Lee himself. He says "I resigned on the 20th, and wished it to take effect on that day" (95). Still he did not say so in his letter (87); and he must have known that it would take several days for it to reach the President, who alone could accept it. Moreover, the President was not bound to accept it, and if he had not, what would have been the status of General Lee?

We do not propose to traverse in detail the pages of this work devoted to military his-

tory pure and simple. That would indeed be an endless task. But there are statements here and there which ought not to be overlooked. Men who remember 1861 cannot fail to perceive the difference between estimates of Southern ability to maintain a war then made, and those put forward in this volume (96, 97). Then the balance was declared to be decidedly in favor of the South. Now it is altogether the other way. Unprejudiced judges will be apt to decide that the estimates of 1861 were the nearer to the truth. The negro slaves of the South, if they remained faithful as they were expected to do, and did do, were an important element in the problem of military strength. Every man and woman of them was a worker. They constituted an army of disciplined laborers several millions strong. They fed the armies of the Confederacy and did much of the drudgery of actual war. Whereas in the North, the larger half of the laboring class were not workers, and none of them were disciplined. They had to be enlisted, clothed, equipped and drilled before they could be used as pick men and shovellers in the army. Then the Southern country, where most of the campaigns had to be conducted, was positively pestilential to the unacclimated Northern man. A glance at the number of deaths from disease in the Northern armies shows how these armies were handicapped. It was a case not unlike that now existing in Cuba where the whole power of Spain seems to be unable to make much headway against the comparatively insignificant armies of insurgents.

There is too much of the "might have been" in the book. Hypothetical history appears on every other page almost. General Lee is reported to have said, "Had I Stonewall Jackson at Gettysburg I would have won a great victory" (142). The author says "Had the Southern attack been made in the forenoon \* \* \* Johnston would have had greater success" (146). "If old Stonewall had travelled to Richmond on his car \* \* \* he would have swept around on A. P. Hill's left," etc., etc. (158). "Had Longstreet followed Stuart's march \* \* \* these heights could have been occupied and McClellan's command attacked and destroyed" (166). All this is unprofitable and there is too much of it in the book.

From the author's description of the seven days' fighting before Richmond, and the condition of McClellan's army when it reached Harrison's Landing (165) it is not easy to see why General Lee did not put an end to it there and then. Perhaps his own army was in an equally bad or even worse condition. The safety of McClellan's army cannot be altogether attributed to the forbearance of his adversary. Something stronger than considerations of humanity induced "The respective commanders of the two armies \* \* \* to rest and recruit their forces" (170).

The character of General Pope as the evil genius of the army, is somewhat uncharitably drawn on the lines laid down by the newspaper correspondents of the day. While we would not undertake a defense of Pope, we think that the correspondence between him and General Halleck clearly shows that the rôle of evil genius was played by the latter. Pope was not a free agent in his Virginia Campaign. He says in a letter written to General Halleck, September 30th, "No man knows better than yourself the constancy, the energy, and the zeal with which I endeavored to carry out your programme in Virginia," and General Halleck when he telegraphed to Pope under date of August 31, "You have done nobly" (Reb. Rec. XII. Part II., 79), and again on the following day "I want to issue a complimentary order, but as you are daily fighting it could hardly be distributed. I will do so very soon" (*ib.* 82), was evidently trying to soothe the man whom he felt that he had injured. But all this is hardly germane to the Life of General Lee, and might very properly have been omitted.

The author's estimate of McClellan as a general (220) is probably nearer what will be the final verdict of history than most of those given, either by the friends or the political enemies of that officer; and General Lee's correct appreciation of his character is no

insignificant item in the evidence of his own ability. McClellan's popularity with his troops ought to have been equal to an army corps in an emergency. But he never called it into account on the battle-field when it was required.

The Southern method of measuring a federal line of battle is simple but inaccurate. Almost every Southern writer assumes that the number of men reported "Present for duty equipped," is the number that can be put in line of battle. As a matter of fact only about 75 per cent. of that number can be so placed. Of course the Union armies generally outnumbered their adversaries but not nearly so much as Southern writers insist on. The morning reports of the Union armies account for every man for whom rations were drawn. The absence of such records on the Southern side enables historians to make their own estimates with comparative safety. Most Southern commanders—all in fact except Joseph E. Johnston—report the number of muskets in line of battle as the strength of their armies, without any specification as to the method of enumeration. It is a very good way, but it furnishes a very false foundation for comparison.

But there was a military necessity for superior numbers on the Northern side. As a rule they had to attack their adversary in a chosen position and frequently intrenched, and that kind of work requires, and always has required at least double the number of the defenders. Major Anderson's garrison defended themselves very creditably when the odds against them were perhaps 100 to 1; but that, under the circumstances, was no evidence of superior fighting ability. Then again, as the Northern armies advanced into the Southern country every mile of railroad in their rear, every railway station, bridge and culvert had to be guarded, and even the seemingly peaceful inhabitants within their lines had to be watched. Thus every advance weakened their lines of battle and added to the difficulties of their situation.

The story of Gettysburg is very well told; but it tells nothing that was not already known. Pickett's charge remains a mystery. No one seems to be able to tell why Lee assaulted Meade's line at that particular point, any more than they can why Burnside assaulted Marye's Heights. There is a striking similarity between these two extraordinary events, down even to the fact that the Commanding General in each case accepted all the responsibility. If the assault had been successful in either case the success would have been magnificent. But the chances were sadly against success. Lee may have been compelled to play a desperate game. His army had been concentrated to fight; but could not keep concentrated for any length of time. It must disperse in order to subsist. Dispersion in the presence of a concentrated adversary was impossible. A victory was a necessity, and as his adversary would not attack he was obliged to, and so did it in a way that would enhance the value of success. But there was no excuse for Burnside's blunder.

Gettysburg was the high-water mark of the Confederacy and we need not follow its ebbing tide. General Lee maintained throughout his high reputation as a commander of men, and although some may question the wisdom and humanity of prolonging the life of a moribund Confederacy at the cost of so much suffering and blood, none will question the superior ability of its guardian.

JAMES CHESTER,  
Captain 3d Artillery.

### Field Exercises \*

Nearly two years ago I had the pleasure of reading and the privilege of reviewing the annual report of the commandant of the Cavalry and Light Artillery School at Fort Riley. There was urged in this review the not unreasonable belief that the practical work in minor tactics illustrated so fully and thoroughly at this school was not beyond the facilities

\* *Field Exercises*. Supplementary Report of Brig. Gen'l James W. Forsyth, Com'd'g Dept. California, 1895.

at almost any army post. General Forsyth, the commandant above referred to, having by promotion transferred his activity to broader fields, now, in his report of field exercises in the department of California, clearly proves the fairness of that proposition, and even exceeds expectation in the face of the customary scanty sums allotted the army for anything beyond mere existence. It is a sad commentary on our unprophetic military methods that the entire department of California was unable to furnish adequate field transportation for the ten company-organizations. This supplementary report consists of a short introductory report by General Forsyth, to which is attached seven appendices. The latter are as follows :

Appendix No. 1. General Forsyth's address to officers preliminary to the course of instruction. Among the many important military matters discussed in his address is the question of umpiring; and the same conclusions are reached as when similar work was done at Fort Riley; namely, that umpiring on the field must be very limited in character, the main means for the correction of tactical errors being the reports written subsequent to the manoeuvres. General Forsyth seems loath to go beyond this without more experience and a better system than any of which he has knowledge. Two principal objections seem to him insuperable. First, the impossibility of suspending the action at any time by means of any signal yet devised. Second, the difficulty of determining a just result of the actions of opposing bodies in the confusion and excitement which surrounds an umpire. The matter of delay is also considered serious, but it is noticed that the brigade commander was most liberal in the matter of recreation and rest during the period of the manoeuvres. Signals by bugles are of course too subject to deadening influences; but would it be impossible to stop all movements for umpires' decisions at fixed intervals of time, or by means of day rockets which would be visible and audible to all? For purposes of close decision, would it not be possible to tabulate influences, to which an umpire could refer in these pauses and on which his decision could be based? As an example of such tables, we could cite those constructed by Major Livermore, U. S. Army, in his system of *Kriegspiel*, founded on data gathered from the records of actual practice; and in some values, such as losses from different kinds of fire, based on the results of extensive war operations. This would at least throw out of the conditions any feeling of dissatisfaction arising from a suspicion that an umpire's judgment might not be mature or exact.

Appendix No. 2. Extracts from the provisions of camp orders and circulars.

Appendix No. 3. General provisions respecting the practical detail of the system of instruction. Among these it was ordered that reports of subordinate commanders should be rendered promptly within the time designated, and especial stress was laid on this. As pointing this military moral, the uncertain knowledge we have of the battle of Chantilly was due to lack of promptness in making reports. The principal officers in this battle were Kearny, Stevens and Reno. The two first were killed on the field, while the third, on whom devolved this important duty, was killed two weeks after without having reported the affair.

Appendix No. 4. Tactical principles and conventional rules for guidance of umpires and participants in the exercises.

Appendix No. 5. Problems solved and discussed during the course of instruction. These problems were : 1. Outposts. 2. Contact of advance and rear guards—defense of a city. 3. Temporary outposts for protection of an army bivouacking in a village. The two first problems were practically illustrated by exercises.

Appendix No. 6. Orders for the regulation of exercises and comment on the results of their execution. These exercises were as follows :

1. Reconnaissance—small exploring and expeditionary patrols.
2. Reconnaissance—strong exploring patrols.

3. Reconnaissance—small patrols.
4. Reconnaissance—strong expeditionary patrols—contact.
5. Special Reconnaissance—contact in close country.
6. Special Reconnaissance—attack of a position in difficult, open country—combat.
7. Contact of small advance guards—open country.
8. Contact in open country by advance guards of the three arms.
9. Outposts in close and open country.
10. Escort and defense of a convoy by road.
11. Advance guard vs. rear guard—close and difficult country. Defense of defile.
12. Rear guard vs. advance guard—defense of village.
13. Forced march of concentration.

The above exercises occupied about thirty days. The progressive character of the instruction is very apparent, being limited, of course, by the number of organizations participating. It will be noticed in appendix No. 7, that there were present for these exercises but seven companies of infantry, two troops of cavalry and one light battery. There are in the army, not counting schools of instruction, 3 posts having more than one regiment, 1 of eleven companies, 4 of eight companies and 7 with full regiments. In his report for 1895, the inspector general can cite but few instances in which other than parade ground exercises were performed; and in the cases of these few, the work done was not extensive. The camp at Monterey has furnished us an excellent example of what can be accomplished at almost any post of fair size, when inspired by progressiveness and military enthusiasm. One rises from the reading of this report with the renewed realization that nothing of value can ever be created or carried out without thorough preparation, unremitting work, earnestness and energy. It is plain that we have here a modern general officer, backed by the tireless and hearty coöperation of a genuine staff.

The comments of the commanding general, given in full after each set of orders for exercise, are the main sources of interest as they not only tell, between the lines, the manner of execution of these orders but also the military principles involved and the reasons for success and failure. It is impossible to avoid quoting a most excellent summary of a trouble which seems peculiarly our own.

"In the transmission of printed orders and giving of verbal orders on the field (especially in combat exercises), care should be taken to leave as much discretion, independence and responsibility with subordinates as is consistent with a supervision of their action. Subordinates who are held down by minute and detailed instructions and restrictions become timid and dependent. In this condition they are not only of no assistance to superiors, but also helpless.

"Those, on the contrary, in whom confidence is placed, and whose independence is not interfered with, become enterprising and ambitious, energetic and bold. The former system robs an officer of all capacity for initiative; the latter creates, fosters and increases this quality.

"Nothing is more valuable to a commander than proper and correct initiative on the part of his subordinates, yet some commanders are in the habit of considering any independence of action on the part of subordinates as a usurpation of their own prerogatives. This is a fatal error, for no such commander could ever be successful with a large command.

"A distinguished commander has well said, that the very best way to spoil a really good officer is to continually usurp his functions and interfere with a legitimate exercise of his discretion. In my own opinion, less harm is liable to result by permitting an occasional exercise of really poor judgment, in small matters, than would result from depriving subordinates of all discretion by continuous correction of and interference with their



methods. When correction becomes necessary in cases of good intentions but poor judgment, it should be administered in such a manner as not to discourage initiative and independence."

The comments on the demerits of the reconnaissance sketches would seem to point to a positive necessity for careful preliminary study and practice in rapid field sketching at every army post. Indeed, the lack of thorough instruction in many essentials, regarded in other armies as elementary, is constantly met throughout these comments, the remedy for which appears to be placed in the hands of the Department Commander by Par. 230, A. R. It is very plain that much confusion and disappointment was the direct consequence of the slight attention paid to field work in the annual course of instruction for troops in garrison. In the road reports submitted there seem to have been many annoying omissions, such as, the breadth of roads, character of bridges, available defensive positions gradients, etc. To remedy this, would it not be possible to attach to sketches a printed form of report, such as used by Col. Hale of the British army? The face of this report is divided by horizontal lines into subheads (such as bridges, rivers, positions) with space for writing; and on the reverse fold, the items of information under these heads. As, VII. Rivers: depth, width, rapidity, nature of banks and bottom, boats, passages, command of one bank over the other. This would not only be an efficient guide, but save much writing.

A very commendable arrangement was the assignment of cavalry and infantry officers to command bodies of light artillery. A field knowledge of the three arms is peculiarly valuable to an American officer and this recognition of his possible future needs is in keeping with the progressive spirit of these exercises.

There is one result alone which would fully justify all the painstaking labor that this work has cost, and that is the indubitable proof of the need for such field exercises. The commanding general learns perhaps wherein his system or scheme needs readjusting, and is shown the limitations of his subordinates' military preparation; line officers find the true relation between theory and practice, to say nothing of convincing proofs of past neglects; the rank and file, the real meaning and need for discipline and self-control and the value of good leadership. The tactical lessons taught are numberless, but are learned only after many wearisome repetitions. The men at Monterey are to be congratulated on their good luck in having had such opportunities to learn their profession.

H. L. HAWTHORNE,

1st Lieut., 1st Artillery.

### Columbia Bicycles, 1896.

The Columbia Bicycle catalogue has made its nineteenth annual appearance, and is just what might be expected from the Pope Manufacturing Company. Aside from its interest in the detailed information given in regard to Columbia and Hartford bicycles, the production can certainly be prized as a high example of the designers' art and the printers' skill, and it will no doubt be eagerly sought by those who indulge in the latest fad of collecting bicycle catalogues.

The pamphlet consists of fifty pages with sixteen full-page illustrations in rich half tone, giving an accurate idea of the beauties of the famous Columbias in their different models. There are also several views of the immense factories at Hartford, Conn. The margins of the letter press are relieved by fancy sketches suggesting the evolution of the bicycle from the old "hobby horse on wheels," the old veloce and high machines, down to the present twenty-two and a half pound ladies' wheel and "Model 40."

The work is interesting from another view, in that it is practically a history in a concise form of bicycle manufacture in this country, for it is well known that Colonel

Pope, the president of this great concern, is the pioneer of the bicycle industry in America.

In detail the catalogue indicates no radical departure in the Columbia model from last year's, there being really no room for improvement save in minor details, and to these the attention of the manufacturers has been specially directed. It may be obtained from the Pope Manufacturing Co., at Hartford, Conn., for two 2-cent stamps, or by calling on any Columbia agent.

### Remington Bicycle, 1896.

Did you ever see a Remington rider take his bicycle apart? Well, if you never did, you just want to get one to do it for you as a sideshow. It is the simplest piece of mechanism you ever saw in your life, and seems the more so as you generally associate the ideas of complication and a bicycle together. One of the most mysterious things in mechanics to a novice or a non-rider is a bicycle. He will gaze at it with perfect wonder, and it's a toe clip to a toboggan slide that if he attempts to handle it he will get all tangled up with his anatomy, and come out of the scrap the worse for wear. The other day a young chap with a Remington bicycle took it apart and put it together while we were lolling in the shade just for the fun of the thing. He took a little wrench out of his pocket, rattled it around the handle for a second or two, took them off, took out the head, slipped off the chain, wiggled his fingers around the sprocket for another few seconds, and pulled off the crank, took out the sprocket bearings, dislocated the rear wheel, and, in fact, in about three minutes had a metallic hash lying on the grass that didn't look any more like a bicycle than a keg of nails. Then he sat down and gloated over the scrap heap like a miser over gold. This chap was the antipodes of the novice. He just delighted to dabble in mechanics, although he was a young limb of the law. He fairly fondled that little scrap heap, indeed, almost embraced it. Wanting to go on, he was urged to commence to get it together again so it could be ridden. He didn't want to be in a hurry, said there was time enough, and on doubts being expressed at there being "time enough"—and anyone would have thought so by looking at the tangle—he set to and made a bicycle of the stuff in less than four minutes. Never saw anything to equal the simplicity of that Remington bicycle. If you have got a boy that always wants to dabble with the internal apparatus of a watch you will save big money by buying him a Remington wheel. You won't save a cent on his table board, but he will have lots of fun making the wheels go round. And that is a reminder of another fact, which is that some men increase their weight by riding a bicycle extensively, and others reduce it. And that begets another memory that you will always observe that a man's mind is broadened by bicycle riding, and not one single case where it is narrowed. And that opens another cell in the memory loft which discloses the fact that bicycle riding begets generosity in mind and matter—makes men more charitable with their means and more charitable in their construction of the conduct of other people. And that pries out another fact, that a clergyman who rides a bicycle daily preaches a better and a brighter gospel sermon. And that forces another fact that somebody has just had a long Tandem tour and is so sleepy that he is moralizing, and, come to think of it, he is.

### Representative of an Active Industry: The Electrical World.

The New Year's number of *The Electrical World*, of New York, "the pioneer journal of its class in America," is a publication of extraordinary size for a technical journal, consisting of no less than 136 pages, and, as we learn from the publishers' announcement, requiring over 10 tons of paper for the edition printed, 18,000 copies.

The contents, as usual, are varied in character, and appeal to all classes of intelligent Americans. An article of interest to non-technical readers, is one of the many striking

electrical processes that have been developed at Niagara through the cheap electrical current furnished by the great electric generating plant at that place. Another is on the electric lighting of the Capitol at Washington, and the conclusion, with a summing up, is given of a controversy carried on in the columns of *The Electrical World* for some months on the "Invention of the Electromagnetic Telegraph," part in which has been taken by authorities from all over the world.

Electricians will be interested in a series of practical articles begun in this issue on Central Station Working, as well as in articles on a storage-battery central-station, and on the testing of storage-batteries, while amateurs will find directions for making a small dynamo motor.

One of the commendable features of *The Electrical World* is a weekly digest of the current technical electrical literature of the entire world, which enables readers to keep pace with electrical advance in every section of the globe. A list of more than 68 journals is given from which abstracts are regularly made, which includes 9 English, 14 French and 12 German publications; there are besides Italian and Japanese journals and all the leading American technical and college periodicals.

*The Electrical World* is published weekly at 253 Broadway, New York, and costs \$3.00 a year, including postage in the United States, Canada or Mexico, or 10c. a copy of newsdealers.

#### A Brief History.\*

This work has been undertaken mainly as the initial step in a gratuitous effort to revive the North Carolina Society of the Cincinnati. The edition will be a very limited one, and in offering it to those interested, the publisher desires to state that his aim is also to disseminate the valuable information it contains, while partially reimbursing himself for the expense attending its publication.

The book contains over one hundred pages, and is embellished with numerous portraits of North Carolina Revolutionary patriots, a copy of General Jethro Sumner's letter appointing delegates to the first meeting of the General Society of the Cincinnati in 1784, a copy of certificate of membership in the North Carolina Society of the Cincinnati and a number of historical North Carolina autographs.

Price, postpaid, in paper cover, \$1.00; in cloth, \$1 50.

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\**A Brief History of the North Carolina Troops on the Continental Establishment, with a Register of Officers of the same.* By Charles L. Davis, Captain 10th Infantry and Brevet-Major, U. S. Army; Member of the Pennsylvania Historical Society; Professor of Military Science, Bingham School, Asheville, N. C. Also, *A Sketch of the North Carolina Society of the Cincinnati, from its organization in 1783 to its so-called dissolution after 1790.* By Henry Hobart Bellas, LL.B., Captain, U. S. Army; Member of the Pennsylvania Historical Society; Honorary Member of the Delaware and New Hampshire Historical Societies, etc.



## Prize Essay—1896.

I.—The following Resolution of Council is published for the information of all concerned :

*Resolved*, That a Prize of a Gold Medal, together with \$100 and a Certificate of Life Membership, be offered annually by THE MILITARY SERVICE INSTITUTION OF THE UNITED STATES for the best essay on a military topic of current interest ; the subject to be selected by the Executive Council and the Prize awarded under the following conditions :

1. Competition to be open to all persons eligible to membership.  
2. Each competitor shall send three copies of his Essay in a sealed envelope to the Secretary *on or before September 1, 1896*. The Essay must be strictly anonymous, but the author shall adopt some *nom de plume* and sign the same to the Essay, followed by a figure corresponding with the number of pages of MS.; a sealed envelope bearing the *nom de plume* on the outside, and enclosing full name and address, should accompany the Essay. This envelope to be opened in the presence of the Council after the decision of the Board of Award has been received.

3. The prize shall be awarded upon the recommendation of a Board consisting of three suitable persons chosen by the Executive Council, who will be requested to designate *the Essay deemed worthy of the prize*; and also in their order of merit those deserving of honorable mention.

In determining the essay worthy of the prize, the Board will be requested to consider its professional excellence, usefulness and valuable originality, as of the first importance, and its literary merit as of the second importance. Should members of the Board determine that no essay is worthy of the prize, they may designate one or more essays simply as of honorable mention ; in either case, they will be requested to designate one essay as first honorable mention. Should the Board deem proper, it may recommend neither prize nor honorable mention. Should it be so desired, the recommendation of individual members will be considered as confidential by the Council.

4. The successful Essay shall be published in the Journal of the Institution, and the Essays deemed worthy of honorable mention shall be read before the Institution, or published, at the discretion of the Council.

5. Essays must not exceed twenty thousand words, or fifty pages of the size and style of the JOURNAL (exclusive of tables).

II.—The Subject selected by the Council at a meeting held Sept. 13, 1895, for the Prize Essay of 1896, is

**"THE PROPER MILITARY INSTRUCTION FOR OUR  
OFFICERS; THE METHOD TO BE EMPLOYED,  
ITS SCOPE AND FULL DEVELOPMENT."**

III.—The gentlemen chosen by the Council to constitute the Board of Awards for the year 1896 are :

GENERAL E. S. OTIS, U. S. A.

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COL. L. H. CARPENTER, U. S. A.

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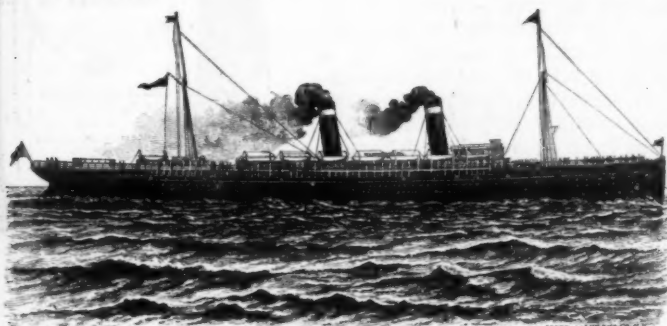


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NEW YORK	10,803	560	63½	PARIS	10,795	560	63½
KENSINGTON	8,669	494	57	SOUTHWARK	8,607	494	57
FRIESLAND	7,116	455	51	WESTERNLAND	5,736	455	47
BERLIN	5,526	510	44	NOORDLAND	5,212	419	47
CHESTER	4,770	461	44	WAESLAND	4,732	443	43
PENNLAND	3,760	374	42	BELGENLAND	3,692	423	40
RHYNLAND	3,689	423	40	OHIO	3,392	355	43
PENNSYLVANIA	3,166	355	43	ILLINOIS	3,163	355	43
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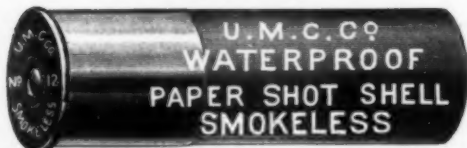
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